ENVIRONMENTAL AUDIT, INC. ®

1000-A Ortega Way, Placentia, CA 92870-7162
714/632-8521 FAX: 714/632-6754

29th ANNIVERSARY
email:sbright@envaudit.com

November 3, 2008

EAI Project No. 1576

Tom Hall
City of Santa Fe Springs Fire Department
11300 Greenstone Avenue
Santa Fe Springs, CA 90670

SUBJECT: REMEDIAL INVESTIGATION WORK PLAN
11630-11700 Burke Street
Santa Fe Springs, CA 90670

Dear Mr. Hall:

Enclosed herewith for your review and approval is a copy of the Environmental Audit, Inc. (EAI) report for the above-referenced real property entitled "*Remedial Investigation Work Plan*," dated November 3, 2008. Mr. Larry Patsouras, the property owner, will be forwarding under separate cover to you an executed Environmental Oversight Agreement for this work.

Please call me at (714) 632-8521, ext. 224 if you have any questions.

Sincerely,

ENVIRONMENTAL AUDIT, INC.

Steven A. Bright
President

SAB:ss

enclosure

cc: Larry Patsouras (w/enclosure)
David Bacharowski, RWQCB (w/enclosure)

SAB:1576:TRANSWORKPLAN2

REMEDIAL INVESTIGATION WORK PLAN

11630-11700 Burke Street
Santa Fe Springs, CA 90670

Prepared for:
LARRY PATSOURAS
11700 Burke Street
Santa Fe Springs, CA 90670

EAI Project No. 1576

November 3, 2008

Prepared by:

ENVIRONMENTAL AUDIT, INC.®

1000-A Ortega Way
Placentia, CA 92870
(714) 632-8521

TABLE OF CONTENTS

TABLE OF CONTENTS

FIGURES:

APPENDICES:

1.0 INTRODUCTION

This document constitutes a Remedial Investigation Work Plan (Work Plan) for the real property identified as 11630-11700 Burke Street, Santa Fe Springs, Los Angeles County, California 90670 (Site) (see Figure 1). Environmental Audit, Inc. (EAI) was retained by Mr. Larry Patsouras, the current property owner, to prepare this Work Plan. The Site, approximately 8.5 acres, is identified by the County of Los Angeles as Assessor's Parcel Number 8168-001-008.

1.1 BACKGROUND INFORMATION

For reporting purposes the Site has been divided into the "East Parcel" where Mr. Patsouras operates El Greco, a wholesale grocery warehouse, and the "West Parcel" where Talco Plastics formerly operated until 1997 (see Figure 2). Talco Plastics was in the business of reprocessing plastic resins, i.e., plastic scrap purchased from various sources was ground and further palletized by extrusion. All of the former Talco Plastics facilities, except an office building, were removed from the West Parcel of the Site pursuant to permits issued by the City of Santa Fe Springs.

Historically, the Site Mitigation Unit (SMU), Health Hazardous Materials Division, County of Los Angeles Fire Department was initially working on environmental issues associated with the Site. On June 4, 1997, the SMU forwarded a letter to Mr. Jim Ross of the California Regional Water Quality Control Board, Los Angeles Region (RWQCB) transferring the case to the RWQCB due to the presence of chemicals, e.g., tetrachloroethene (PCE) and trichloroethene (TCE) detected in ground water beneath the Site.

Mr. Patsouras has been working with the City of Santa Fe Springs on redeveloping the West Parcel formerly occupied by Talco Plastics. The City of Santa Fe Springs Fire Department (SFSFD) has requested that some additional work be completed for the Site, e.g., removal of bat traps or clarifiers, sump, and a waste oil underground storage tank (UST) suspected to be located on-site, and completion of a risk assessment, including soil gas data, before the SFSFD will consider the redevelopment being proposed for the West Parcel. Additionally, since chemicals have been detected in ground water beneath the Site the SFSFD will not authorize redevelopment of the West Parcel without concurrence from the RWQCB.

The SFSFD case manager overseeing work at the Site is Mr. Tom Hall. Based on discussions with Mr. David Bacharowski of the RWQCB on October 23, 2008, the RWQCB has concurred that the SFSFD can oversee the additional removal, soil gas investigation, and risk assessment efforts being required for the Site by the SFSFD, with the understanding that the results of this work will be forwarded to the RWQCB for concurrence before redevelopment, and that Mr. Patsouras will work directly with the RWQCB to address ground water issues (see Appendix A).

1.1.1 Summary of Prior Site Work

1.1.1.1 Assessments

Several assessments of the Site have been completed over the years by various entities including Advanced GeoEnvironmental, Inc. (AGI), AIG Consultants, Inc. (AIG), Amnat Environmental & Geotechnical (AEG), EAI, and Professional Services Industries, Inc. (PSII) (see Section 4.0).

The AGI and AEG assessments focused on the 12,000-gallon diesel UST and 10,000-gallon gasoline UST systems formerly located on the West Parcel. These USTs, including the fuel island and associated piping, were removed from the Site on March 24, 1998 (see Figure 2). Based on review of the report documenting removal of these USTs (see AGI, 1998), the SFSFD issued a no further action (NFA) letter for the USTs dated May 1, 1998.

Pursuant to a closure authorization issued by the SFSFD on January 7, 1999, the storm water clarifier located west of the Office Building situated on the West Parcel of the Site was removed (see Figure 2). On August 25, 1999, the SFSFD issued a closure certification for the storm water clarifier.

Assessment efforts by EAI and PSII for the Site included (see Figure 3):

- **East Parcel**:
  - Storage Shed
  - Abandoned Clarifiers
  - Historical Stained Area

- **West Parcel**:
  - USTs
  - Clarifiers (Historical Paint/Steam Cleaning Area)
  - Mechanical Pit
  - Maintenance Shop

Soil samples were analyzed for total recoverable petroleum hydrocarbons (TRPH) by EPA Method 418.1, total petroleum hydrocarbons, carbon chain breakdown (TPH-CC) by modified EPA Method 8015, volatile organic compounds (VOCs) by EPA Method 8020 and 8240, Title 22 metals by EPA Methods 6010B/7471A, and polychlorinated biphenyls (PCBs) by EPA Method 8081A. Low levels of VOCs were detected in soil including PCE, TCE, acetone, toluene, xylenes, ethylbenzene, trichlorofluoromethane, n-butylbenzene, n-propylbenzene, naphthalene, p-isophropyltoluene, sec-butylbenzene, 2-butanone, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, and1,3,5-trimethylbenzene, TRPH at concentrations as high as 33,000 milligrams per kilogram (mg/kg), and the following metals; barium,

cadmium, chromium, cobalt, copper, nickel, vanadium and zinc. (see EAI, 1994, 1995, and 1997A).

Due to the Sites proximity to the Pilot Chemical Company facility located immediately east of the Site at 11756 Burke Street, the Phibro-Tech, Inc. facility located immediately south of the Site at 8851 Dice Road, regional ground water contamination issues, and the results of Site assessment efforts, two ground water monitoring wells (MW-1 and MW-2) were installed on the Site (see Figure 3). VOCs detected in ground water samples collected from wells MW-1 and MW-2 included 1,1-dichlorothene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), chloroform, 1,1,1-trichloroethane (1,1,1-TCA), carbon tetrachloride, 1,2-dichloroethane (1,2-DCA), TCE, PCE, toluene and xylenes. Several metals were detected in unfiltered ground water samples including barium, chromium, cobalt, copper, nickel, vanadium, and zinc. However, no metals were detected in filtered ground water samples (see EAI, 1997A).

1.1.1.2 Remediation

In 2006, Biophysics Environmental Assessment, Inc. (BEA) submitted to the SFSFD a Soil Remediation Work Plan (see BEA, 2006A) and Addendum to Soil Remediation Work Plan (see BEA, 2006B) outlining soil excavation for two areas on the East Parcel, i.e., storage shed (EAI Borings E-9 and HA-1) and abandoned clarifier area (EAI Boring B-7). On August 9, 2006 the SFSFD issued a letter approving the Soil Remediation Work Plan as Amended.

Between August 16 and 18, 2006, BEA excavated two trenches to approximately 20 feet below ground surface (bgs) in areas of the storage shed and abandoned clarifier area (see BEA, 2006C). A total of 25 soil samples were collected from the two trenches, i.e., 12 from the storage shed trench and 13 from the abandoned clarifier area trench, and each soil sample was analyzed for TPH-CC, VOCs, and Title 22 metals. No VOCs were detected in any of the soil samples analyzed. The maximum concentration of total petroleum hydrocarbons as diesel (TPH-D) detected in soil samples was reported at 146 mg/kg and the highest concentration of total petroleum hydrocarbons as oil (TPH-O) was 183 mg/kg. Arsenic barium, chromium, copper, cobalt, nickel, and vanadium were detected in the 25 soil samples (see BEA, 2006C).

In order to determine if the chemicals detected in soil by BEA were problematic, BEA compared the chemical concentrations detected to EPA Region IX Preliminary Remediation Goals (PRGs) developed for residential (PRG-R) and industrial/commercial (PRG-I) land use and City of Santa Fe Springs Soil Assessment and Remediation Guidelines for Commercial-Industrial Sites (City Soil Guidance). No chemicals, except arsenic, were detected in the 25 BEA soil samples analyzed above PRGs or City Soil Guidance levels. While arsenic was present in soil above PRGs, it was concluded by BEA that the arsenic concentrations detected were in the range of background for Native California soils, and therefore, required no further action.

BEA concluded that no further action is warranted for soil exclusively, and that no sufficient mass of hydrocarbon materials is present in the soil column which may pose a threat of migration to the ground water.

On October 6, 2006 the SFSFD issued a letter providing comments on the BEA Soil Remediation Report of Findings (see BEA, 2006C). This letter indicates that no further action will be required for the two areas excavated by BEA in August 2006. However, the letter identified other units, i.e., two clarifiers, a sump, and possible waste oil UST that require closure by the SFSFD, before redevelopment can be considered.

1.1.1.3 SFSFD Meeting

On October 15, 2008 a meeting was held at the Site with Mr. Tom Hall of the SFSFD, Mr. Larry Patsouras, and Mr. Steven Bright and Mr. Boris Stolin of EAI to go over the additional work being required for the property by the SFSFD, and how best to coordinate work with the RWQCB. During the Site visit, two clarifiers, two sumps, and a paved area where a pipe was protruding from the ground (suspected location of the "bat traps" identified by AIG in 1994) were identified (see Figure 4 and Appendix B). Mr. Hall requested that all these subsurface units be removed from the Site.

The need for a soil gas survey of the West Parcel was discussed based on the historical use of the Site, proximity of the Site to the Pilot Chemical Company and Phibro-Tech, Inc. facilities, and regional ground water contamination issues. Data from the soil gas survey will then be used to complete a human health screening evaluation for potential vapor intrusion into the new building being proposed for the West Parcel.

A waste oil UST was suspected to be located on the Site adjacent to the former fuel USTs, based on information contained in the Phase I Report prepared by AIG (see AIG, 1994). The suspected presence of a waste oil UST was based on review of a drawing contained in the SFSFD file for the Site; however, there was no permit for a waste oil UST and AIG did not encountered any field evidence of a waste oil UST during their Site inspection in 1994. Further, no evidence of a waste oil UST was noted during removal of the fuel USTs in 1998. Therefore, EAI concluded that a waste oil UST was never installed on the Site and no further action is required to address this issue.

It was agreed, assuming RWQCB concurrence, that the SFSFD would oversee the additional removal, soil gas investigation, and risk assessment efforts being required for the Site by the SFSFD, with the understanding that the results of this work will be forwarded to the RWQCB for concurrence before redevelopment, and that Mr. Patsouras will work directly with the RWQCB to address ground water issues (see Appendix A).

2.0 PROPOSED SCOPE OF WORK

2.1 PERMITS

A permit will be obtained from the SFSFD to remove the subsurface units depicted on Figure 4. Excavation efforts will be completed in accordance with South Coast Air Quality Management District (SCAQMD) Rule 1166 permit conditions. EAI has a various locations SCAQMD Rule 1166 permit and the SCAQMD will be notified of the planned excavation efforts, and monitoring and reporting will be completed in accordance with the permit conditions.

2.2 UTILITY CLEARANCE

Prior to initiating field work, excavation areas and soil gas sampling locations will be marked, reviewed by the property owner for possible utility conflicts, and Underground Service Alert (USA) notified.

2.3 HEALTH AND SAFETY

All field work will be completed in accordance with the requirements outlined in the EAI Health and Safety Plan for the Site (see Appendix C).

2.4 EXCAVATION EFFORTS

For purposes of this report the subsurface units to be removed from the Site have been identified herein as Subsurface Unit #1 through Subsurface Unit #5 (see Figure 4). The subsurface units depicted on Figure 4 will be removed from the Site using an excavator, backhoe or similar equipment. Based on a visual inspection completed on October 29, 2008, liquid appears to be present only in Subsurface Unit #3. The liquid present in Subsurface Unit #3 was sampled by BEA in 2006 and no hydrocarbons or VOCs were detected (see Page 4 of BEA, 2006C). The liquid present in Subsurface Unit #3 will be removed prior to physically removing the unit.

Following completion of excavation efforts, confirmation soil samples will be collected and analyzed from the excavations (see Section 2.4.2.1) to determine if cleanup objectives have been achieved. In the event that cleanup objectives have not been achieved when the areas have been excavated as initially planned, additional excavation may occur until cleanup objectives have been achieved or an alternative cleanup plan provided to the SFSFD for review and approval.

In the event that any other subsurface units are encountered during excavation efforts beyond those described herein, the SFSFD will be immediately notified of the type and location of the units, and these units will also be removed from the Site.

2.4.1 Air Monitoring

Air monitoring during excavation efforts will be completed in accordance with SCAQMD Rule 1166 permit conditions. Readings will be taken approximately every 10 minutes and these readings will be recorded on a direct reading air monitoring log.

2.4.2 Confirmation Soil Sampling

2.4.2.1 Excavation Areas

Confirmation soil samples will be collected from the bottom of each excavation following removal of the subsurface units pursuant to City Soil Guidance requirements, i.e., from two feet below the invert of the unit. A minimum of two confirmation soil samples will be collected from the bottom of each excavation (one from each end) assuming the excavation is 15 feet in length or less. If the length of the excavation is greater than 15 feet, one additional confirmation soil sample will be obtained for every 5 feet in excess of 15 feet. Soil samples for VOC analysis will be obtained in accordance with EPA Method 5035 requirements, e.g., using EnCore Samplers. Soil samples for metals analysis will be collected in stainless steel tubes.

2.4.2.2 Excavated Stockpiled Soil

Soil excavated as part of the removal of the subsurface units will be stockpiled on-site, on an asphalt or concrete paved area. One soil sample for every 100 cubic yards of soil excavated and stockpiled on-site will be analyzed to determine if the soil is suitable for reuse on-site as backfill material. Only demonstrated clean fill will be used to backfill the excavations.

2.4.2.3 Imported Soil

It will be necessary to import soil to replace the void created by removal of the subsurface units. Currently, there is a soil stockpile on the East Parcel of the Site that Mr. Patsouras reportedly obtained from the City during placement of a sewer line in Burke Street. One soil sample for every 100 cubic yards of soil to be used from this stockpile will be analyzed to determine if the soil is suitable for use on-site as fill.

2.4.3 Analytical Testing

Confirmation soil samples will be delivered for analytical testing to Enviro-Chem, Inc. (ECI), a State of California certified hazardous waste testing laboratory (ELAP Certification #1555). ECI is certified for all tests proposed as part of this investigation.

Confirmation soil samples from the bottom of the excavations, excavated soil stockpile, and soil stockpile currently located on-site and being proposed for use as fill, will be analyzed for total petroleum hydrocarbons as gasoline (TPH-G), as diesel (TPH-D) and as oil (TPH-O) by modified EPA Method 8015, VOCs by EPA Method 8260B, semi-volatile organic compounds (SVOCs) by EPA Method 8270C, and Title 22 Metals by EPA Methods 6010B/7471A.

2.4.4 Action Levels

In order to determine if the chemicals detected in confirmation soil samples are problematic from a human health exposure perspective, the concentrations detected will be compared to California Human Health Screening Levels (CHHSLs) established for residential and industrial/commercial land use, EPA Region IX Regional Screening Levels for Chemical Contaminants (SLCCs) established for residential and industrial/commercial land use (note SLCCs replaced EPA Region IX Preliminary Remediation Goals as of May 20, 2008) and City Soil Guidance levels. Additionally, the concentrations will be compared to RWQCB Site Assessment and Cleanup Guidebook Table 4-1 (ground water quality based screening levels) for soil residual concentrations.

2.4.5 Backfilling and Compaction of Excavated Areas

Following completion of excavation efforts, the excavation areas will be backfilled and compacted in accordance with City of Santa Fe Springs requirements.

2.4.6 Reporting

A comprehensive written report documenting the work completed at the Site will be prepared and submitted to the SFSFD. The report will include:

- Detailed description of work completed.
- Site plan including location of subsurface units removed, limits of areas excavated, and sampling locations.
- Tabular summary of all analytical data, including copies of the chain of custody (COC) records and laboratory reports.
- Volume of soil excavated, including analytical testing results.
- Volume of soil shipped off-site.
- Volume of soil imported to the Site, including analytical testing results.
- Manifests, weight tickets, etc., documenting disposal of wastes.
- Photographs taken during Site work.

2.5 SOIL GAS SURVEY

Discussions with Mr. Andrew Laqaretto of the City of Santa Fe Springs Planning Department, indicates the Site is not located in a Methane Zone, and therefore, testing soil gas samples for methane is not required.

H&P Mobile GeoChemistry (H&P) will complete the soil gas sampling activities, under the supervision of EAI staff. Soil gas sampling and analysis will be conducted in accordance with the guidelines contained in the Department of Toxic Substances Control (DTSC) and RWQCB document titled "*Advisory - Active Soil Gas Investigations*," dated January 28, 2003. Soil gas samples will be analyzed on-site by a mobile laboratory operated by H&P for the primary VOC target compounds identified in the "*Advisory - Active Soil Gas Investigations,*" using EPA Method 8260B. Two samples collected in Summa Canisters will be analyzed by H&P at its fix-based laboratory for full range VOCs by EPA Method TO-15. The Summa Canister soil gas samples will be collected from sample locations at 5 and 10 feet bgs with the lowest concentrations of VOCs detected on-site by EPA Method 8260B.

2.5.1 Sampling Methods and Procedures

A general description of the soil gas sample collection procedures is provided below. Appendix D contains a copy of the H&P detailed field sampling procedures.

The West Parcel of the Site will be divided into 100' by 100' grid segments, as recommended in RWQCB, 2003 and soil gas samples collected and analyzed from the approximate center of each grid segment from 5 and 10 feet bgs (see Figure 5). All probes will be installed hydraulically using direct push methods. Once the probe is driven to the desired sampling depth, the hollow probe drive-rods will be withdrawn. A small diameter inert nylaflow tubing and filter will then be inserted in the borehole to the desired depth. An on-off valve will be placed on the tip of the tubing at the ground surface. Clean graded No. 3 kiln dried sand will be poured around the tubing and filter to allow for diffusion of soil gas vapors. Each boring will then be backfilled with granular bentonite to about 1.5 feet bgs, and the remaining annular space with hydrated bentonite to the surface.

The probes will be allowed to equilibrate for at least 30 minutes, prior to collecting soil gas samples for analytical testing. Soil gas samples for on-site VOC analysis will be collected from the inert tubing using a 20 to 60 cubic centimeter syringe connected via the on-off valve located at the surface tip of each probe. Each probe will then be purged based on a pre-determined purge volume established by the purge volume test (see Section 2.5.1.1). A sample of the in-situ soil gas will then be withdrawn and immediately transferred to the on-site H&P mobile laboratory for analytical testing within minutes of sample collection.

Two soil gas samples will also be collected using Summa Canisters. Each Summa Canister will contain a choke that will evacuate the canister at a rate of about 150 milliliters per

minute. The Summa Canister samples will be analyzed off-site for VOCs by EPA Method TO-15. The Summa Canister samples will be collected from the sample locations at 5 and 10 feet bgs with the lowest concentrations of VOCs detected on-site by EPA Method 8260B.

2.5.1.1 Purge Volume Test

A purge volume test will be conducted at the beginning of the soil gas survey to purge ambient air from the sampling system to ascertain the purge volume with the highest concentration. The initial soil gas sample point will be purged of one, three and seven volumes and then each sample will be analyzed on-site for VOCs. The purge volume resulting in the highest concentration of VOCs will be the purged volume used for the remaining sample point locations.

2.5.1.2 Use of Tracer Compound to Ensure Probe Seal Integrity

A tracer compound, 1,1-Difluoroethane, will be used to test for leaks around the probe at the ground surface and in the sampling system. The tracer will be placed around the base of the probe barrel and at the top of the probe barrel during sampling. Each soil gas sample will be analyzed for 1,1-Difluoroethane, the presence of which confirms a leak.

2.5.1.3 Quality Assurance and Quality Control

A Quality Assurance and Quality Control Program will be implemented as part of the soil gas sampling process. The primary quality control features of the program included the collection and analysis of field quality control samples, and the validation of data. Quality control samples collected in the field will include duplicate samples. Data validation will be performed and samples will be analyzed for the specified suite of analyses presented in Section 2.5.1. Data for each of the analyses will be evaluated in the following areas:

- Data completeness
- Holding times
- Blanks
- Laboratory control standards
- Matrix spike/matrix spike or sample duplicates
- Compound identification and quantitation

2.5.2 Human Health Screening Evaluation

In order to determine if the VOC concentrations detected is soil gas beneath the Site require further evaluation, the concentrations detected in soil gas samples collected at 5 feet bgs will be compared to CHHSLs established for residential and commercial/industrial land use. Note there are no CHHSLs established for soil gas samples collected at 10 feet bgs. Assuming that no VOCs are detected in the soil gas samples collected at 10 feet bgs and that the

concentrations detected in samples collected at 5 feet bgs are below CHHSLs, then no further evaluation will be completed.

In the event that soil gas concentrations detected from the samples collected at 5 feet bgs exceed CHHSLs or VOCs are detected in soil gas samples collected at 10 feet bgs, a Tier 2 human health screening evaluation will be completed for the inhalation pathway using DTSC guidance as outlined in its documents titled "*Preliminary Endangerment Assessment Guidance Manual*," dated January 1994, revised June 1999, and "*Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*," dated December 15, 2004, revised February 7, 2005.

2.5.3 Reporting

A comprehensive written report presenting the findings of the soil gas survey and human health screening evaluation will be prepared and submitted to the SFSFD.

2.6 SAMPLE CONTAINERS AND PRESERVATIVES

EAI will supply the EnCore Samplers and stainless steel tubes to be used to collect the soil samples, and H&P will supply the syringes and Summa Canisters used to collect the soil gas samples. No preservatives will be used for any of the media samples.

2.7 SAMPLE IDENTIFICATION, DOCUMENTATION, PACKAGING AND SHIPPING

To identify and manage the samples collected in the field, a sample label will be affixed to each sample container. Each sample label will include the following information:

- Sample identification number and depth
- Date and time of sample collection
- Purge volume (soil gas samples only)
- EAI project number
- Name of client
- Name of sampler

Following sample collection and labeling, the soil samples will be placed into a high quality ice chest for temporary storage and transport to the analytical laboratory. Soil gas samples will be immediately analyzed on-site within minutes of sample collection. The following protocol will be used for soil sample packaging:

- A self-adhesive sample label will be placed across the lid of each sample container, acting not only as a sample label but also as a custody seal.

- The samples will be placed in leak-proof "Ziploc" plastic bags.

- The samples will then be placed into a high quality ice chest that will include ice to keep the samples chilled during transport to the laboratory. The drain plug of the ice chest will be secured using tape to preclude melting ice from leaking out of the cooler.

- The COC record forms will be placed in a "Ziploc" water-resistant plastic bag and taped to the inside lid of the cooler.

- The samples will be kept chilled until delivered to the laboratory for analytical testing.

COC record forms will be used to document sample collection and shipment to the laboratory for analytical testing. The COC record form identifies the contents of each shipment, the analytical testing to be completed on each sample, and maintains the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until received by the laboratory, the custody of the samples is the responsibility of the sample collector.

2.8 MANAGEMENT OF WASTES

In the process of removing the subsurface units, potentially contaminated investigation-derived wastes (IDW) will be generated. These wastes include spent personal protective equipment (PPE), liquid removed from the subsurface units, the surface units, and asphalt and concrete. Spent PPE, e.g., gloves, will be double bagged and placed in a municipal refuse dumpster.

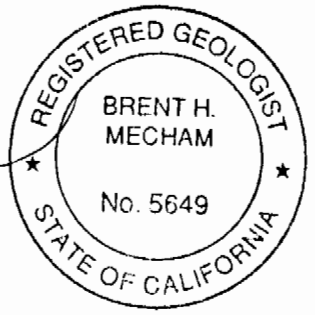
All other wastes will be properly handled to preclude the potential for spreading contamination, creating a sanitary hazard, or causing liter to be left at the Site. Manifests, disposal receipts, etc., will be included in the report to be prepared documenting work completed at the Site.

3.0 LIMITATION

Our professional services have been performed using that degree of knowledge, diligence, care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at this time. EAI assumes that information provided by third parties is true, accurate and reliable. The recommendations contained in this report are based on information contained and/or referenced herein, and our best judgment. No other warranty, expressed or implied, is made as to the professional advice contained in this report.

Respectfully submitted,

ENVIRONMENTAL AUDIT, INC.



Brent H. Mecham, RG, REA II
Project Manager

Boris Stolin, PE
Manager Environmental Engineering

Steven A. Bright, REP, REA I
President

SAB:BS:BHM:pje

4.0 REFERENCES

Advanced GeoEnvironmental, Inc., "Soil Sampling Following Removal of Underground Storage Tanks, Talco Plastic, Inc., 11650 Burke Street, Santa Fe Springs, California," dated April 1, 1998 (AGI, 1998).

AIG Consultants, Inc., "Phase I Environmental Site Assessment, Industrial Buildings 11630-11700 Burke Street, Santa Fe Springs, California 90670," dated June 30, 1994 (AIG, 1994).

Amnat Environmental & Geotechnical, "Leak Detection Program (LDP) Report, Talco Plastics, 11650 Burke Street, Whittier, California," dated September 1995 (AEG, 1995).

Biophysics Environmental Assessments, Inc., "Soil Remediation Work Plan, El Greco, Inc., 11630-11700 Burke Street, Santa Fe Springs, California," dated June 29, 2006 (BEA, 2006A).

Biophysics Environmental Assessments, Inc., "Addendum to Soil Remediation Work Plan, El Greco, Inc., 11630-11700 Burke Street, Santa Fe Springs, California," dated July 26, 2006 (BEA, 2006B).

Biophysics Environmental Assessments, Inc., "Soil Remediation Report of Findings for El Greco, Inc., 11630-11700 Burke Street, Santa Fe Springs, California," dated September 14, 2006 (BEA, 2006C).

California Environmental Protection Agency, "Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties," dated January 2005 (Cal-EPA, 2005A).

California Regional Water Quality Control Board, Los Angeles Region/Department of Toxic Substances Control, "Advisory-Active Soil Gas Investigations," dated January 28, 2003 (RWQCB, 2003).

City of Santa Fe Springs, "Soil Assessment and Remediation Guidelines for Commercial/ Industrial Sites," (City Soil Guidance).

Department of Toxic Substances Control, "Preliminary Endangerment Assessment Guidance Manual," dated January 1994, second printing June 1999 (DTSC, 1999).

Department of Toxic Substances Control, "Interim Final, Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air," dated December 15, 2004, Revised February 7, 2005 (DTSC, 2005A).

Environmental Audit, Inc., "Preliminary Draft, Remedial Investigation, 11630-11700 Burke Street, Santa Fe Springs, California," dated December 22, 1994 (EAI, 1994).

Environmental Audit, Inc., "Subsurface Investigation Report, 11630-11700 Burke Street, Santa Fe Springs, CA 90670," dated December 18, 1995 (EAI, 1995).

Environmental Audit, Inc., "Supplemental Subsurface Investigation, 11630-11700 Burke Street, Santa Fe Springs, CA 90670," dated March 13, 1997 (EAI, 1997A).

Environmental Audit, Inc., "Remedial Action Plan, 11630-11700 Burke Street, Santa Fe Springs, California," dated June 16, 1997 (EAI, 1997B).

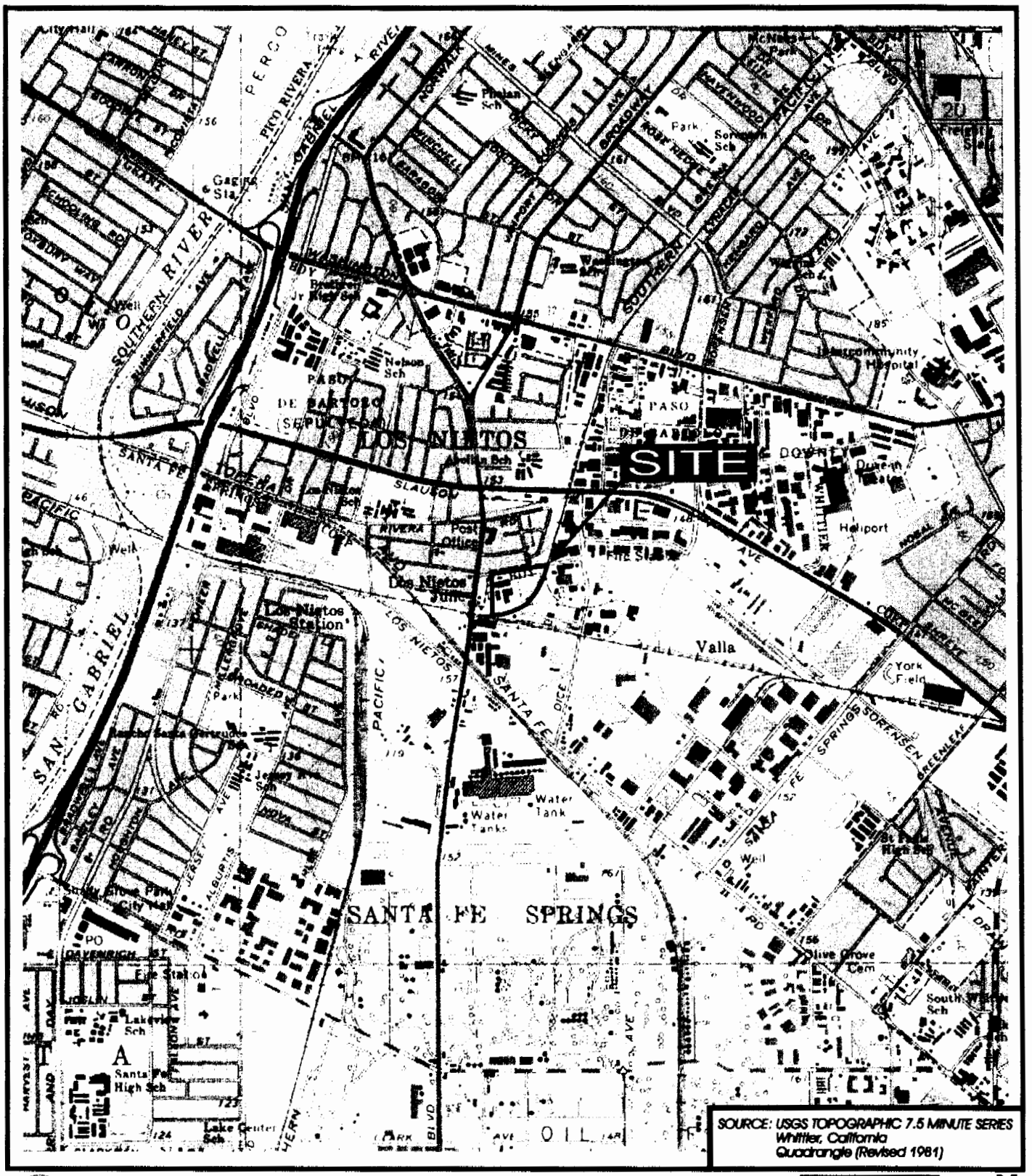
Environmental Audit, Inc., "Report on Soil Sampling and Testing, 11630-11700 Burke Street, Santa Fe Springs, California," dated March 1, 1999 (EAI, 1999).

Professional Service Industries, Inc., "Phase II Preliminary Contamination Assessment, 11630-11700 Burke Street, Santa Fe Springs, California," dated August 18, 1994 (PSII, 1994).

United States Environmental Protection Agency, Region IX, "Regional Screening Levels for Chemical Contaminants at Superfund Sites," dated May 20, 2008 (EPA, 2008).

FIGURES

FIGURES



Environmental Audit, Inc.

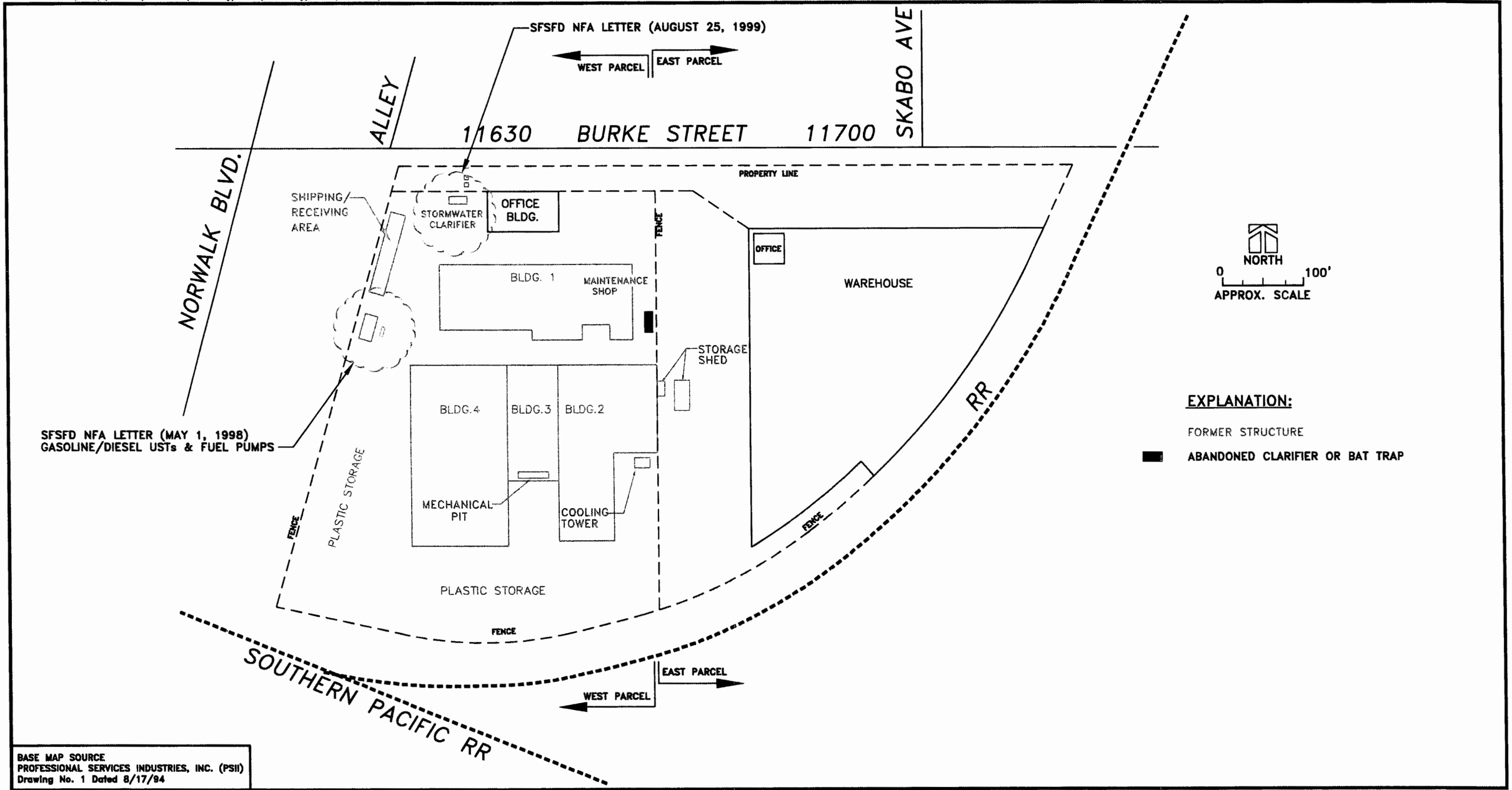
SITE LOCATION MAP
11630 - 11700 Burke Street
Santa Fe Springs, CA 90670

Project No. 1576

Figure 1

N:\1576\SiteLocMap.cdr

I:\1576\Site Plan (rev.4) **(Created)** 11/21/94 **(Drawn By)** M.C. **(Check By)** S.B. **(Last Rev.)** 10/29/08



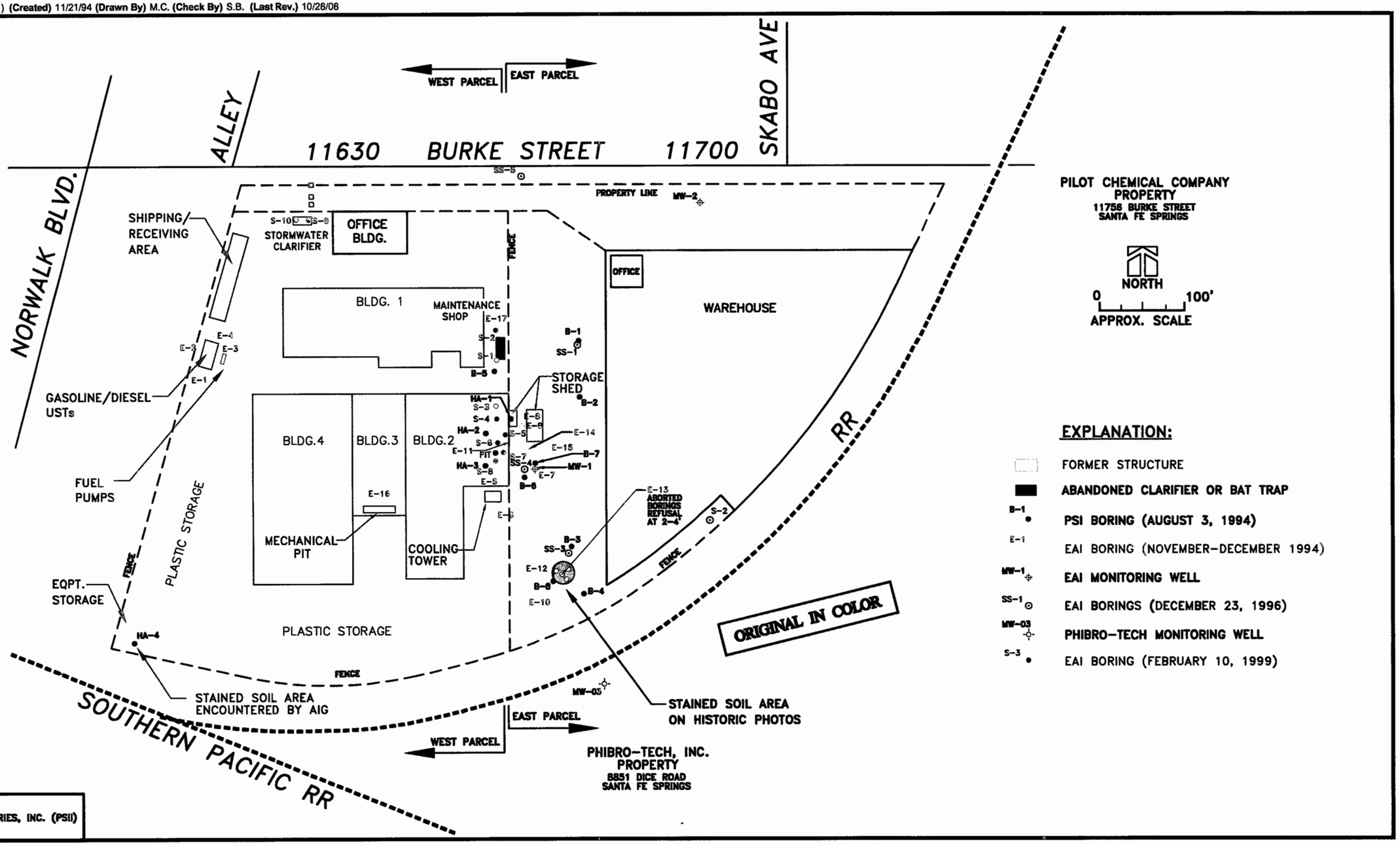
Environmental Audit, Inc.

SITE PLAN
11630 - 11700 Burke Street
Santa Fe Springs, CA 90670

Project No. 1576

Figure 2

I:\1576\Media Sampling Locations (rev.1) **(Created)** 11/21/94 **(Drawn By)** M.C. **(Check By)** S.B. **(Last Rev.)** 10/28/08



BASE MAP SOURCE
PROFESSIONAL SERVICES INDUSTRIES, INC. (PSII)
Drawing No. 1 Dated 8/17/94

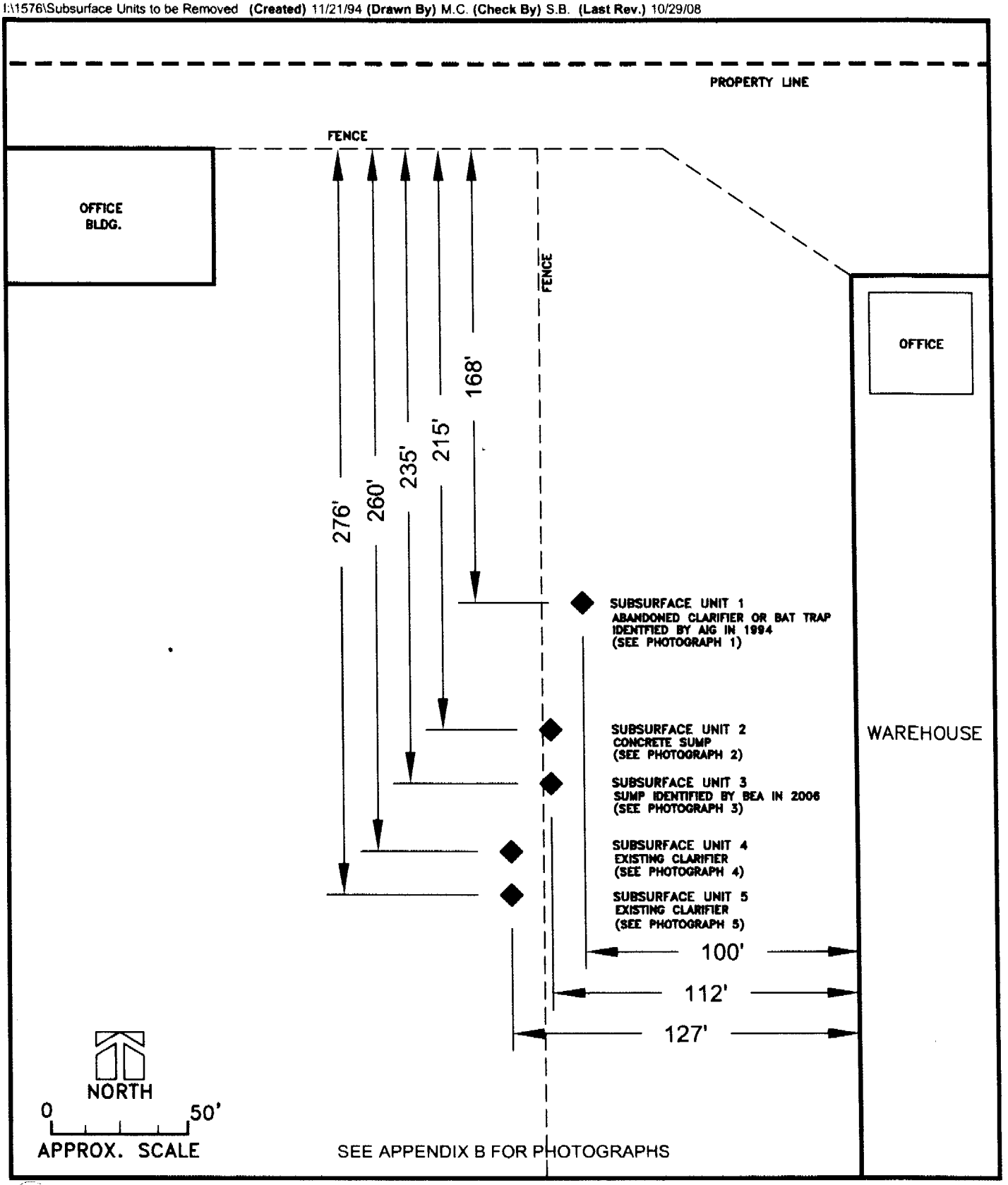
Environmental Audit, Inc.

HISTORICAL MEDIA SAMPLING LOCATIONS
11630 - 11700 Burke Street
Santa Fe Springs, CA 90670

Project No. 1576

Figure 3

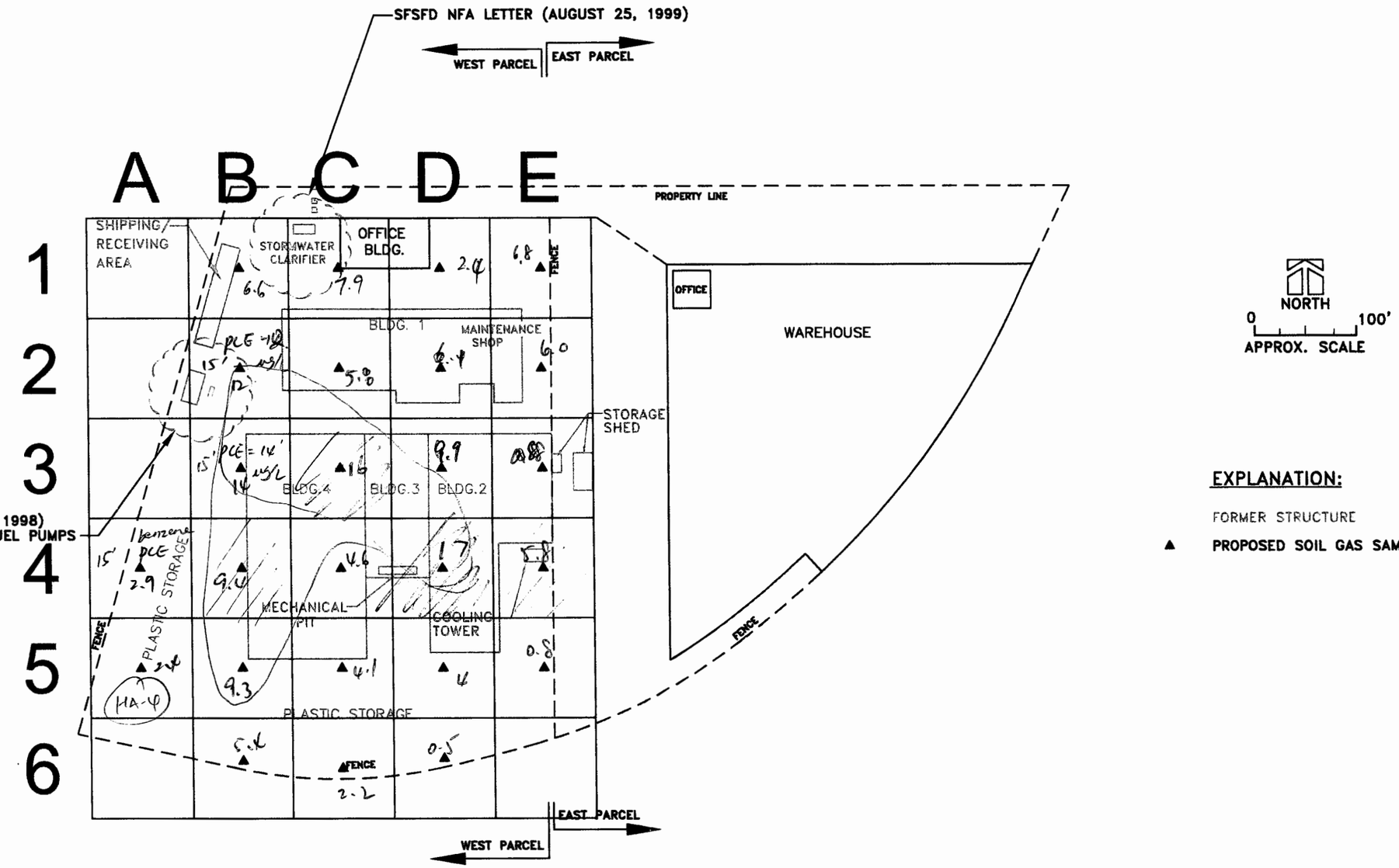
I:\1576\Subsurface Units to be Removed **(Created)** 11/21/94 **(Drawn By)** M.C. **(Check By)** S.B. **(Last Rev.)** 10/29/08



Environmental Audit, Inc.

SUBSURFACE UNITS TO BE REMOVED
11630 - 11700 Burke Street
Santa Fe Springs, CA 90670

I:\1576\Proposed Soil Gas Sampling Locations **(Created)** 11/21/94 **(Drawn By)** M.C. **(Check By)** S.B. **(Last Rev.)** 10/29/08



EXPLANATION:

FORMER STRUCTURE

▲ **PROPOSED SOIL GAS SAMPLING LOCATION**

BASE MAP SOURCE
PROFESSIONAL SERVICES INDUSTRIES, INC. (PSII)
Drawing No. 1 Dated 8/17/94

Environmental Audit, Inc.

PROPOSED SOIL GAS SAMPLING LOCATIONS
11630 - 11700 Burke Street
Santa Fe Springs, CA 90670

Project No. 1576

Figure 5

APPENDIX A

EAI Letter dated October 23, 2008 to Mr. David Bacharowski of RWQCB

ENVIRONMENTAL AUDIT, INC. ®

1000-A Ortega Way, Placentia, CA 92870-7162
714/632-8521 FAX: 714/632-6754

29th ANNIVERSARY
email:sbright@envaudit.com

SENT VIA EMAIL
DBACHARO@WATERBOARDS.CA.GOV
AND U.S. MAIL

October 23, 2008

EAI Project No. 1576

David Bacharowski
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: 11630-11700 Burke Street, Santa Fe Springs, CA 90670
(Assessor's Parcel Number 8168-001-008)

Dear Mr. Bacharowski:

As discussed with you today on the phone, the owner of the real property located at 11630-11700 Burke Street, Santa Fe Springs, California 90670 (Site), Mr. Larry Patsouras, has been working with the City of Santa Fe Springs Fire Department (SFSFD) on redeveloping a portion of the Site that was formerly occupied by Talco Plastics. All of the former Talco Plastics facilities, except an office building, were removed from the Site pursuant to permits issued by the City of Santa Fe Springs. For purposes of reporting, the Site has been divided into the "East Parcel" where Mr. Patsouras operates El Greco, a whole grocery warehouse, and the "West Parcel" where Talco Plastics formerly operated (see Figure 1).

The Site is located immediately west of the Pilot Chemical facility at 11756 Burke Street, a cleanup being overseen by the California Regional Water Quality Control Board, Los Angeles Region (RWQCB), and immediately north of the Phibro-Tech, Inc. facility at 8851 Dice Road, a property under the oversight of the Department of Toxic Substances Control (DTSC).

Historically, the Site Mitigation Unit (SMU), Health Hazardous Materials Division, County of Los Angeles Fire Department was initially working on environmental issues associated with the Site. On June 4, 1997, the SMU forwarded a letter to Mr. Jim Ross of the RWQCB transferring the case to the RWQCB due to the presence of chemicals, e.g., tetrachloroethene (PCE) and trichloroethene (TCE) detected in two ground water wells (MW-1 and MW-2) installed on the Site (see Attachment A).

Since 1997, underground storage tanks, clarifiers and some soil remediation work has been completed at the Site by the former property owner and current property owner, under the oversight of the SFSFD. The SFSFD also issued a letter to Mr. Ross dated October 10, 1997 regarding the Site (see Attachment A).

Some additional work, e.g., removal of bay traps, sump and/or clarifier, and completion of a risk assessment, including soil gas data, still needs to be completed before SFSFD will consider the redevelopment being proposed for the West Parcel of the Site by Mr. Patsouras. Additionally, SFSFD has stated that they have no jurisdiction over the ground water issue, and therefore, will not authorize redevelopment without RWQCB concurrence.

Mr. Tom Hall of SFSFD (Telephone No. 562-906-3815) is the person Mr. Patsouras has been working with regarding the Site. Mr. Hall has indicated that SFSFD can and will, with RWQCB concurrence, oversee the additional removal, soil gas investigation, and risk assessment efforts being required for the Site, with the understanding that the results of this work will be forwarded to the RWQCB for concurrence before redevelopment. Mr. Patsouras will work directly with the RWQCB to address ground water issues. It is my understanding from our telephone conversation that this approach is acceptable to the RWQCB.

Your assistance on this matter will be greatly appreciated. Please call me at (714) 632-8521, ext. 224 if you have any questions.

Sincerely,

ENVIRONMENTAL AUDIT, INC.

Steven A. Bright
President

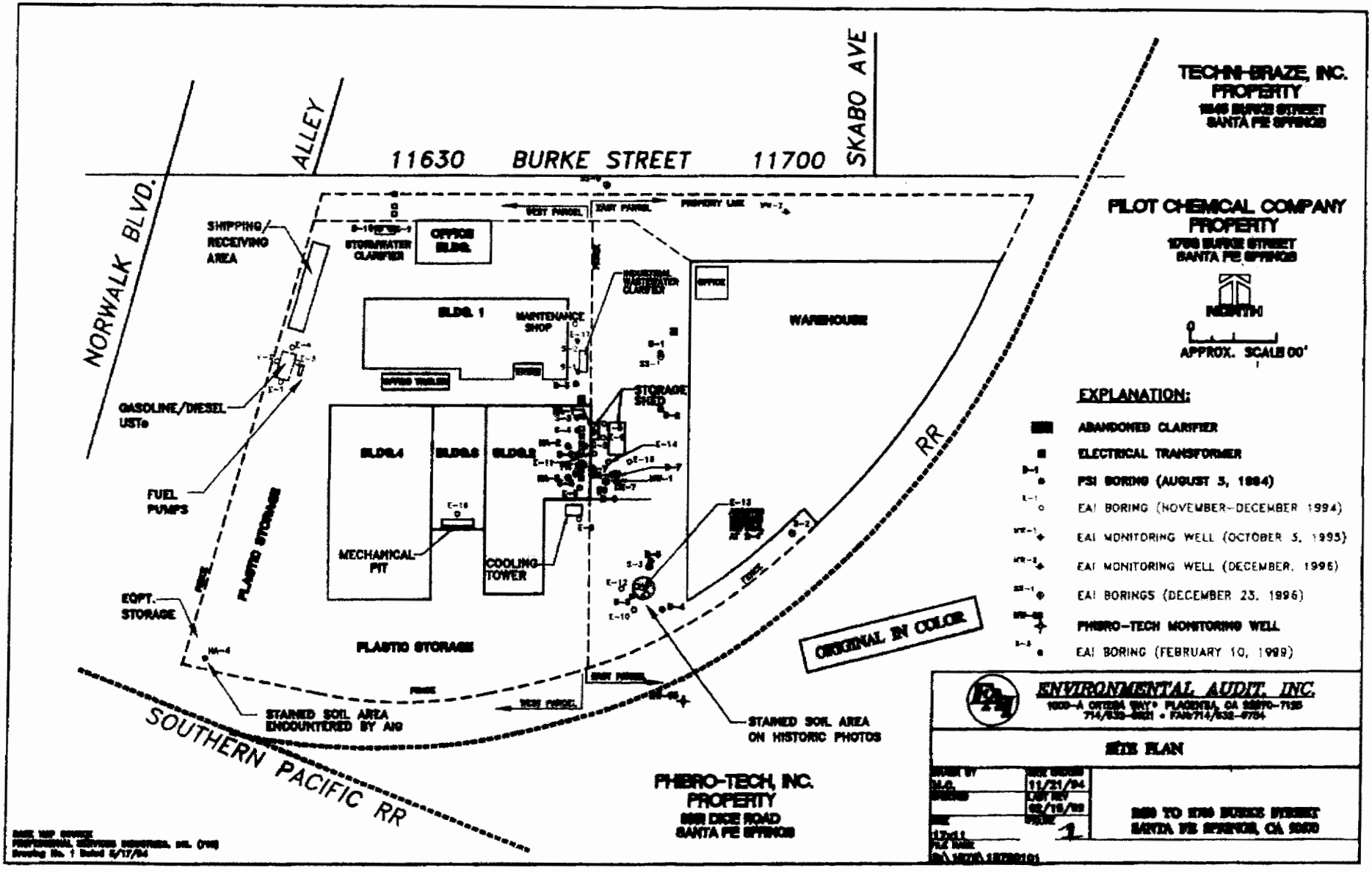
SAB:BS:pje

Attachments:
Figure 1: Site Plan
A: SMU Letter dated June 4, 1997 and SFSFD Letter dated October 10, 1997

cc: Larry Patsouras, El Greco
Tom Hall, SFSFD

SAB:1576EAILRWQCB1008

FIGURE


TECHNI-BRAZE, INC.
PROPERTY
11640 BURKE STREET
SANTA FE SPRINGS
PILOT CHEMICAL COMPANY
PROPERTY
11700 BURKE STREET
SANTA FE SPRINGS
NORTH
APPROX. SCALE 00'
11630 BURKE STREET 11700
SKABO AVE
ALLEY
NORWALK BLVD.
SHIPPING/
RECEIVING
AREA
OFFICE
BLDG.
STORMWATER
CLARIFIER
BLDG. 1
MAINTENANCE
SHOP
WAREHOUSE
STORAGE
SHED
GASOLINE/DIESEL
USTs
FUEL
PUMPS
BLDG.4
BLDG.5
BLDG.6
MECHANICAL
PIT
COOLING
TOWER
PLASTIC STORAGE
EQPT.
STORAGE
PLASTIC STORAGE
STAINED SOIL AREA
ENCOUNTERED BY AIG
STAINED SOIL AREA
ON HISTORIC PHOTOS
SOUTHERN PACIFIC RR
RR
ORIGINAL IN COLOR
EXPLANATION:
ABANDONED CLARIFIER
ELECTRICAL TRANSFORMER
PSI BORING (AUGUST 5, 1994)
EAI BORING (NOVEMBER-DECEMBER 1994)
EAI MONITORING WELL (OCTOBER 5, 1995)
EAI MONITORING WELL (DECEMBER, 1996)
EAI BORINGS (DECEMBER 23, 1996)
PHIBRO-TECH MONITORING WELL
EAI BORING (FEBRUARY 10, 1999)
PHIBRO-TECH, INC.
PROPERTY
888 DICE ROAD
SANTA FE SPRINGS
ENVIRONMENTAL AUDIT, INC.
SITE PLAN
11/21/94
02/15/99
1
888 TO 898 DICE ROAD
SANTA FE SPRINGS, CA 90670

ATTACHMENT A

SMU Letter dated June 4, 1997 and SFSFD Letter dated October 10, 1997

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

Refer reply to:
HEALTH HAZARDOUS MATERIALS DIVISION
5825 Rickenbacker Rd
Commerce CA 90040-3027

June 4, 1997

Jim Ross
Los Angeles Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

Dear Mr. Ross:

SUBJECT: **FORMER PALLEY PROPERTY, 11630 - 11700 BURKE STREET, SANTA FE SPRINGS, CA 90606**

This letter is to confirm the telephone conversation held on June 3, 1997, between Kim Clark of this Department and Jenny Au of your staff, regarding the subject location.

As a result of the above conversation, it was mutually agreed that your department will assume lead agency status for the above subject site. Justification for this decision was based on findings from a subsurface investigation ("Supplemental Subsurface Investigation", dated March 3, 1997) which indicated that groundwater contained the following: PCE = 158 ppb, TCE = 7.4 ppb, 1,1,1 TCA = 1.4 ppb, 1,1 DCE = 2.2 ppb, and chloroform = 1.9 ppb. From these results, sufficient evidence exists of on-site releases to soils resulting in groundwater impact, to refer the matter to your department.

As of July 1, 1997, the Santa Fe Springs Fire Department is the only local agency with enforcement authority over the Hazardous Waste Control Law (CA H&SC Division 20, Chap. 6.5) in their city. All active and closed Site Mitigation Unit (SMU) cases/files in the city of Santa Fe Springs are being referred to that local agency. Consistent with previous referral protocols between our agencies, however, the subject site is being transferred to your agency due to the confirmed groundwater impact.

By copy, this letter also serves as notification to Larry Patsouras, the property owner, that the subject site has been referred to your agency. This Department requests your office and/or Mr. Patsouras to provide the City of Santa Fe Springs Fire Department, Environmental Protection Unit (Certified Unified Program Agency) with all copies of future site correspondence.

If you have any questions, please feel free to call Kim Clark at (213) 890-4114.

Very truly yours,

THOMAS W. KLINGER, SUPERVISOR
SITE MITIGATION UNIT
HEALTH HAZARDOUS MATERIALS DIVISION

T:kc

c: Larry Patsouras
Jack Glaser, Jaffe, Trutanich, Scatena & Blum
City of Santa Fe Springs Fire Department

Fire Department
CITY OF SANTA FE SPRINGS

HEADQUARTERS FIRE STATION · (310) 944-9713 · FAX (310) 941-1817
11300 GREENSTONE AVE. · SANTA FE SPRINGS 90670-4619

October 10, 1997

Mr. Jim Ross
Los Angeles Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

Dear Mr. Ross:

SUBJECT: **FORMER PALLEY PROPERTY, 11630-11711 BURKE STREET, SANTA FE SPRINGS, CA, 90670**

The Santa Fe Springs Fire Department (SFSFD), is in receipt of information indicating that there are groundwater (GW) contamination issues at this site, and are likely area-wide at this location. In a letter dated June 4, 1997, Tom Klinger of the Los Angeles County Fire Department, Health Haz-Mat Division (LACoFD) referred this site to you citing data from subsurface investigations conducted at this site. Other data recently developed further indicates contamination of GW from site soils, and area-wide GW contamination as well.

In a monitoring well, (MW-1) installed near the abandoned clarifiers area, approximately mid-site, first GW was found @ 35' bgs, and the following contaminants were found in a groundwater sample: TCE @ 11.4 ppb, PCE @ 93 ppb, and chromium (Cr) @ 80 ppb. In a nearby HSA boring E-9, PCE was found in a continuous column to 35 ' below ground surface (bgs), from 61 ug /Kg @ 10' bgs, to 104 ug/Kg @ 30' bgs. TCE was negligible. In another HSA boring, installed in 1994, PCE was found @ 510 ug/Kg, and TCE was found @ 72 ug/Kg, at 20' bgs.

Petroleum hydrocarbon contamination (TPH) was found in Boring E-9 to 10900 mg/Kg @ 31' bgs, and in nearby boring B-7 to 18380 mg/Kg @ 25' bgs. The TPH was mostly in the lube-oil range.

GW gradient is estimated to be from NNE to SSW, since in a gauging event in 1/97, the GW depth was found to be around 32' bgs in MW-2, 35' bgs in MW-1, and 37' bgs in MW-3. Interestingly, GW testing in a MW-2, located apparently up-gradient to the NNE from MW-1, showed even higher amounts of VOC's and metals, indicating area-wide contamination migrating onto this site from elsewhere. In this MW-2, located near the upper property line, PCE was found @ 296 ppb, and TCE was found @ 14.5 ppb. 1,1 DCE was found @ 33.2 ppb, and Cr was found @ 90 ppb. In October, 1996, MW-3 to the immediate SSW, on Phibrotech property, showed only TCE @ 21 ppb and no metals were reported.

Halogenated Volatile Organic Compounds (HVOC's) and TPH contamination in soils probably dates from historic Palley property operations. Straightforward demonstrations of contamination columns, in some cases, to GW, have been made. Boring locations and sample analyses are justified based on Phase I information and conformed based site visits by SFSFD staff. Further assessment does not appear to be justified at this time.

There is little in Phase I data or in the nature of known operations at this site which would account for the presence of Cr in groundwater.

The property owner, Mr. Patsouras, has submitted a Remedial Action Plan (RAP), first to the LACoFD, and then to the SFSFD, for removal and replacement by clean fill of approximately 900 cu yds of soils historically contaminated width TPH and HVOC's in the area of old sheds and abandoned clarifiers where the contamination is found. It seems likely to the SFSFD that accomplishing this would substantially reduce GW contamination from this site, as well as eliminate historic soil contamination . Of course it would not solve the apparent area-wide GW contamination issues. The RAP is written by Environmental Audit, Inc., of Placentia, CA , (714) 632-8521. The property owner, Mr. Patsouras, is represented by the law firm of Jaffe, Trutanich, Scatena & Blum. Their environmental attorney is John Glaser, (310) 548-0410.

The SFSFD has advised Mr. Glaser that the SFSFD has no authority in GW contamination issues, but is willing to explore the possibility of oversight of the soil removal RAP with your agency and with the State Department of Toxic Substances Control in accordance with current laws, regulations, and policies.

Should you have any questions about this matter, please contact Steve Chase of this office.

Sincerely,

NORBERT P. SCHNABEL, FIRE CHIEF

Dave Klunk,
Director of Environmental Services

DK/sc

C: Mr. John C. Glaser, Jaffe, Trutanich, Scatena & Blum
222 W. Sixth St., Suite 920, San Pedro, CA 90731

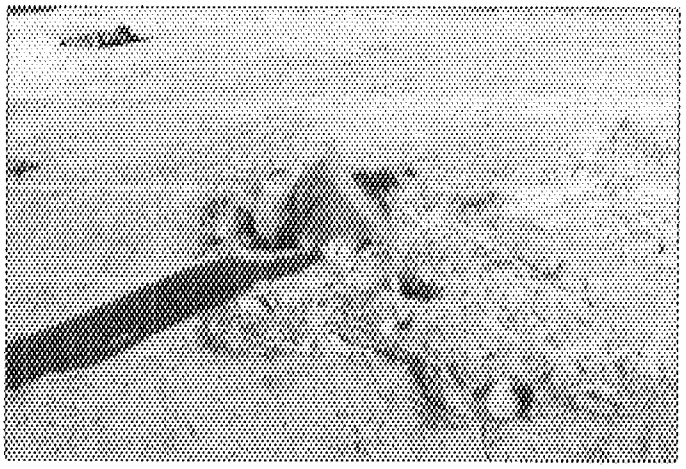
Mr. Edward H. Leonhardt, Environmental Audit, Inc.
1000-A Ortega Way, Placentia, CA 92870

APPENDIX B

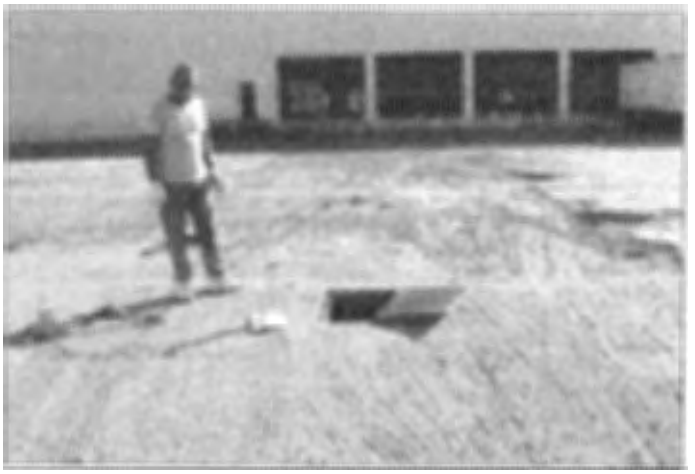
Photographs of Subsurface Units to be Removed

Photograph 1
Subsurface Unit 1

Photograph 2
Subsurface Unit 2



Photograph 3
Subsurface Unit 3



Photograph 4
Subsurface Unit 4

Photograph 5
Subsurface Unit 5

APPENDIX C

EAI Health and Safety Plan dated October 29, 2008

HEALTH AND SAFETY PLAN

11630-11700 Burke Street
Santa Fe Springs, CA 90670

EAI Project No. 1576

October 29, 2008

Prepared by:

ENVIRONMENTAL AUDIT, INC.®

1000-A Ortega Way
Placentia, CA 92870
(714) 632-8521

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0 INTRODUCTION

Environmental Audit, Inc. (EAI) was retained by Mr. Larry Patsouras, the current property owner, to complete remedial investigation work associated with the real property identified as 11630-11700 Burke Street, Santa Fe Springs, Los Angeles County, California 90670 (Site).

1.1 APPLICABLE STANDARDS AND CODES

This Health and Safety Plan (HASP), which was prepared specifically for the Site, describes equipment, procedures and other requirements necessary to ensure the safety of personnel on the Site, to the degree feasible, during Site assessment activities. During the development of this HASP, consideration was given to current safety standards as defined by the U.S. Environmental Protection Agency (EPA), the Occupational Health and Safety Administration (OSHA), and the National Institute of Occupational Safety and Health (NIOSH). This HASP was prepared in accordance with guidelines set forth in Title 8 of the California Code of Regulations, Section 5192 (8 CCR 5192). In addition, this HASP also describes the health effects and standards for chemicals suspected to be present at the Site, and the procedures designed to account for the potential for exposure to unknown chemicals.

1.2 SCOPE AND APPLICABILITY OF THE HEALTH AND SAFETY PLAN

The purpose of this HASP is to define the requirements and designate protocols to be followed by personnel on the Site during field activities. Site conditions, identified sources and previous work elements implemented at the property are described in the EAI report for the Site titled *"Remedial Investigation Work Plan."* This HASP is applicable to all employees, contractors, subcontractors, and visitors to the Site. This HASP will be used to ensure that adequate Site safety practices are used during media sampling activities.

EAI is providing a copy of this HASP to each of its employees and subcontractors who work at the Site in order to fulfill its obligation under 29 CFR 1910.120, to inform contractors of Site hazards. All personnel working at the Site must review the HASP and sign an agreement to comply with its requirements and to signify their familiarity with all aspects of the HASP before entering the Site (see Form 1). All personnel working at the Site will be briefed daily by the Site Safety Officer and will be required to become familiar with the HASP.

The health and safety requirements presented in this document are based on information available from Site records, and an analysis of potential hazards associated with the proposed Site activities. This HASP provides an overview of hazards and establishes worker's safety procedures. Changing and/or unanticipated Site conditions may require modification of this HASP in order to maintain a safe and healthful work environment.

2.0 AUTHORITY AND RESPONSIBILITY

The EAI Site Safety Officer (SSO) is responsible for the daily implementation of the health and safety program. The SSO will be on-site during Site activities to monitor safety and health and decontamination protocols. Prior to initiation of Site activities, the SSO, EAI Project Manager (PM) or qualified designee will verify that EAI personnel and subcontractors who will be on the Site have read, understood and agreed to the health and safety procedures outlined herein. The SSO and PM, individually, have the authority to take appropriate actions or stop work to achieve compliance with this HASP. The EAI personnel assigned and their various roles are listed below:

Assignment	Name	Phone Number
Project Director	Steven Bright	714/632-8521, ext. 224
Project Manager and Site Safety Officer	Brent Mecham	714/632-8521, ext. 226
Field Team	To be determined	

2.1 PROJECT DIRECTOR

The Project Director is responsible for the overall operation of the project. The Project Director will also hold review and planning meetings as necessary with all technical staff, during which the current project progress, problems encountered, and future direction will be discussed.

2.2 PROJECT MANAGER

The PM shall direct all on-site operations. The PM may delegate all or part of these duties to a properly qualified designee. At the Site, the PM assisted by the SSO, has responsibility for:

- Ensuring that appropriate personnel protective equipment and monitoring equipment is available, in good working condition, and properly utilized.

- Establishing that personnel are aware of the provisions of this HASP, are instructed in the work practices necessary to ensure safety, and are familiar with planned procedures for dealing with emergencies.

- Establishing that Site personnel have completed a minimum of 40 hours of health and safety training and have appropriate medical clearance as required by 29 CFR 1910.120, and have been fit tested for the appropriate respirators, if respirator use is warranted.

- Ensuring that Site personnel are aware of the potential hazards associated with their job function.

- Monitoring the safety performance of Site personnel to see that required work practices are employed.
- Preparing any accident report (see Section 13.2).
- Conducting safety meetings (see Section 9.1).
- Ceasing Site operations, if necessary, in the event of an emergency or to correct unsafe work practices.

2.3 SITE SAFETY OFFICER

The SSO's duties may be carried out by the PM or other qualified designee. The SSO:

- Implements the HASP, and reports any deviations from the anticipated conditions described in the plan to the PM.
- Determines that monitoring equipment is properly used and is calibrated in accordance with the manufacturer's instructions or other standards.
- Conducts Site safety meetings.
- Assumes any other duties (that the SSO is qualified to handle) as directed by the PM.
- Provides review of the protection level needs as work is ongoing, and notifies the PM of requisite changes, if any.
- Ensures that decontamination procedures are followed (see Section 10.0).
- Establishes monitoring of personnel and records results of exposure monitoring.

2.4 FIELD TECHNICIANS

The field technicians are responsible for complying with the HASP, notifying the SSO of hazardous or potentially hazardous conditions, and carrying out specialized tasks during field operations. These tasks include inspecting, calibrating, maintaining, and using field equipment; performing Site characterization activities; maintaining decontamination stations; preparing and decontaminating sampling equipment; collecting and preserving samples; and packaging and shipping samples according to proper chain-of-custody procedures.

2.5 FIELD TEAM SIZE

The size of the field team is determined by the nature of the field activities, the characteristics of the Site, the safety hazards involved, and the prescribed levels of safety protection. The field team must be large enough to ensure on-site activities are conducted safely, but not so large as to sacrifice efficiency. Generally, each task will employ a minimum of two team members. EAI personnel will be present during all phases of the field activities.

3.0 FIELD WORK

The planned field work to be completed in association with the investigation activities may include:

- Establish appropriate work zones.
- Mark media sampling locations.
- Identify underground utilities.
- Remove subsurface units, e.g., bay traps and clarifiers.
- Excavate impacted soil, if encountered.
- Install ground water wells.
- Collect soil, soil gas, and ground water samples for analytical testing.
- Conduct personnel monitoring.
- Conduct equipment and personnel decontamination.
- Conduct any other efforts necessary to complete investigation activities.

4.0 UNDERGROUND AND OVERHEAD UTILITIES

EAI will attempt to locate or cause to be located all known underground and overhead utilities prior to the commencement of on-site sampling activities. These efforts will include notification to Underground Service Alert and discussions with the property owner and review of available plans for the Site. Electricity can shock, burn and result in death. All underground and overhead utilities are considered live and dangerous.

5.0 DRILLING AND EXCAVATION SAFETY GUIDELINES

The drilling and excavation contractors are responsible for drill rig and excavation equipment maintenance and safety. The following provides information on EAI's code of safe practices for drilling and excavation.

5.1 DRILLING

- Before moving a drill rig off-road, pay particular attention to obstacles in the route of travel. It is wise to walk the route of travel first.
- Be sure that all tools and supplies located on the drill rig are properly secure prior to movement.
- Always check the brakes of a drill rig carrier before traveling, particularly on rough, uneven, or hilly ground.
- Discharge all passengers before moving a drill rig on rough or hilly terrain.
- Never travel off-road with the mast (derrick) of the drill rig in the raised or partially raised position.
- Have an assistant guide the driver when in close proximity to hazards or when clearance is at a minimum.
- Always consider overhead lines to be live and dangerous.
- Never operate a drill rig within 15 feet of overhead lines, unless special permission from the utility company has been obtained and the power to the lines has been terminated.
- Clear the drilling area, to the degree feasible, to accommodate the drill rig and supplies, and to provide a safe working area.
- Establish a work zone around the drilling rig, and permit only those personnel and equipment required for the task within the zone. Avoid drilling in areas of debris and thick vegetation.
- Work in well ventilated areas.

- Ensure that proper housekeeping is maintained around and on the drill rig and mobile laboratory. Tools should be maintained in a manner that permits for convenient access but also provides for safety.

- Keep platforms and walkways free from obstructions and excess grease or oil that could cause a surface to become slick and dangerous.

- Watch for slippery ground when mounting/dismounting platforms.

- Always wear appropriate clothing and safety equipment when operating drilling equipment.

- Check all equipment and tools prior to starting work. If the equipment or tools are damaged, either repair them before using or replace them.

- Handle augers with care. Use proper lifting techniques, and stay clear of rotating augers.

- Observe proper lifting and drums moving techniques.

- Always know the safe working load of the equipment being used, and never exceed this limit.

- Never leave a load suspended in the air unattended.

- When drilling outside, avoid drilling during an electrical storm.

- Never consume alcoholic beverages, depressants, stimulants or any other substance which alters job performance while on the job.

- All unattended boreholes must be adequately covered or otherwise protected.

5.2 EXCAVATION

- Construction of a trench or excavation which is five feet or deeper, into which a person is required to descent, requires a CAL/OSHA permit. An Activity Notification Form must be completed and forwarded to the nearest OSHA office prior to commencement of work.

- Workers shall report immediately all accidents, injuries and illness to the SSO or PM.

- Anyone known or suspected to be under the influence of intoxication liquor or drugs shall not be allowed on the Site while in that condition.

- Horseplay, scuffling, or other acts that tend to adversely influence the safety and well being of workers are prohibited.

- Surface encumbrances that are located so as to create a hazard to workers shall be removed or supported, as necessary, to safeguard workers.

- The estimated locations of underground utilities shall be determined prior to opening an excavation by contacting USA and reviewing available plans for the Site.

- While the excavation is opened, underground installations shall be protected, supported, or removed as necessary to safeguard workers.

- Workers exposed to vehicular traffic shall wear vests or other suitable garments marked with or made of reflective or high-visibility material.

- No worker shall be permitted underneath loads handled by lifting or digging equipment.

- All persons shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by spillage or failing materials.

- Where stability of adjoining buildings, walls, structures, sidewalks and/or pavements are endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure stability for the protection of the workers and public.

- Adequate physical barrier protection shall be provided at all excavations and trenches.

Daily inspections of the excavation, the adjacent areas, and protective systems shall be made, at the start of the shift and as needed throughout the shift, by a competent person for hazardous conditions. Hazardous conditions can include possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other unsafe conditions.

6.0 HAZARD ASSESSMENT

The following potential exposures may exist at the Site:

- Skin contact with contaminated soil.
- Inhalation of vapors.
- Inhalation and ingestion of contaminated materials, especially if poor personal hygiene is practiced.

6.1 CHEMICAL HAZARDS

From an occupational health viewpoint, given that any potential exposure to Site personnel will be only for a short period of time (all field work is anticipated to take between five and 15 days to complete), the levels of contaminants that may potentially be encountered during investigation activities should not represent a significant concern.

The chemicals anticipated to be present on or beneath the Site are petroleum hydrocarbons, chlorinated hydrocarbons, and metals.

Permissible Exposure Limit (PEL): Occupational Health and Safety Administration (OSHA) PELs are time-weighted averages defined as concentrations for a normal 8-hour work day and a 40-hour work week to which almost all workers can be repeatedly exposed to, day after day, without suffering adverse health effects.

Short Term Exposure Limit (STEL): OSHA STELs are defined as the concentration to which workers can be exposed for short time periods without irritation, tissue damage, or narcosis sufficient to likely cause impairment of self-rescue or precipitate accidental injury. The STEL is a 15-minute time-weighted average that should not be exceeded at any time during the work day.

Immediately Dangerous to Life or Health (IDLH): National Institute of Occupational Safety and Health (NIOSH) IDLHS, are defined as a concentration that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.

Chemical	PEL (ppm)	STEL (ppm)	IDLH (ppm)
Benzene	1	5	500
Toluene	50	150	500
Tetrachloroethehe (PCE)	25	100	150
Trichloroethene (TCE)	25	25	100
Lead	0.05(1)	NE	100(1)

(1) = Concentration in mg/m^3 NE = Not established

Appendix B contains additional information on chemicals of concern.

6.2 INHALATION HAZARD

Respirators will be available for use during Site activities, should their use be warranted. Should chemicals be encountered at the Site for which these ensembles will not offer sufficient protection, the SSO or PM will immediately cease activities and determine the appropriate course of action.

6.3 INGESTION HAZARD

Site contaminants can enter the body via ingestion and/or dust inhalation. Because of this, all activities that increase the probability of hand-to-mouth transfer and ingestion of materials including, but not limited to gum or tobacco chewing, smoking, eating and drinking will be prohibited in the Exclusion Zone. Each worker's hands and face will be thoroughly washed and protective clothing removed prior to initiating any hand-to-mouth activity.

6.4 ABSORPTION HAZARD

Skin contact with contaminated materials may result in localized irritation, systemic illness and/or skin lesions at the point of contact. For this reason, skin contact with contaminated materials will be avoided by the use of protective clothing and equipment. Protective clothing and equipment are required in areas where waste materials are handled.

Level D protection is all that is anticipated to be required for this project.

6.5 HEAD HAZARD

All EAI personnel will wear hard hats at all times within the Exclusion Zone.

6.6 PHYSICAL HAZARDS

Physical hazards associated with this project included, but are not limited to: heat stress, slippery terrain, noise, whether conditions, and/or other types of injury (e.g., back) due to heavy lifting are possible during field activities. Heat stress can increase the magnitude of physical hazards on-site. Personal awareness, strict adherence to safety requirements, use of the buddy system, and work breaks will be mandatory to reduce the potential for accidents and injuries to personnel.

6.6.1 Heat Stress

Sweating does not cool the body unless moisture evaporates from the skin. Wearing personal protective equipment (PPE), should it be required, reduces the body's ability to eliminate large quantities of heat since sweat evaporation is decreased.

Problems related to heat stress include heat fatigue, heat rash, fainting, heat cramps, heat exhaustion and heat stroke. Heat rash occurs when sweat does not evaporate, causing the skin to be wet for an extended period of time. Standing erect and immobile in heat also allows blood to pool to lower parts of the body. As a result, blood does not return to the heart to be pumped to the brain. Fainting may then occur.

Heat cramps are painful spasms of the muscles due to excessive salt loss associated with profuse sweating. Losing large amounts of fluid and salt may result in heat exhaustion. The skin will be clammy and moist. Affected persons will also exhibit extreme wetness, giddiness, nausea and headache.

Heat stroke occurs when the body's temperature regulatory system has failed. Symptoms of heat stroke include hot, dry, red and/or spotted skin. The affected person may be mentally confused and delirious. Convulsions also can occur. Early recognition and treatment of heat stroke are the only means of preventing damage or death. A person exhibiting signs of heat stroke should be removed from the work area to a shaded area. A person exhibiting signs of heat stroke should be soaked with water to promote evaporation, and fanned to increase body cooling.

Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks.

- Early symptoms of heat-related health problems include:
  - Decline in task performance
  - Lack of coordination
  - Decline in alertness
  - Unsteady walk
  - Muscle cramps
  - Dizziness

People unaccustomed to heat are particularly susceptible to heat fatigue. Workers using PPE for the first time need to gradually adjust to the heat.

Measures to avoid heat stress include:

- Define work-rest periods (short and frequent are more beneficial than long and seldom).

- Rotate personnel, alternative job function.
- Water intake should be equal to sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of insufficient thirst. Do not depend on thirst to signal when and how much to drink. For an eight-hour work day, 50 ounces of fluids should be consumed.
- Eat lightly salted foods or drink salted drinks, e.g., "Gatorade", to replace lost salts.
- Avoid alcohol.
- Avoid overtime.

6.6.2 Slippery Terrain, Slips, Trips and Falls

Slippery and uneven terrain is common and may increase the risk of injuries. Personnel shall wear the appropriate foot protection while on-site. The SSO will monitor Site work surfaces for potential trip and fall hazards. Overhead hazards consist of potential contact with falling objects, rigging equipment, or other items in use at the Site. Hard hats are required at all times when at the Site.

6.6.3 Noise

Should equipment be used that may exceed a comfortable range, hearing protection devices (e.g., earplugs) capable of reducing noise levels to no more than 85 dBA, will be required.

7.0 EXPOSURE MONITORING

Exposure monitoring will be conducted during Site activities to provide real-time monitoring data which will be used to determine the equipment, procedures and other requirements necessary to ensure the safety of EAI personnel, to the degree feasible.

7.1 CHEMICAL EXPOSURE MONITORING

Prior to the start of field work, daily upwind background readings will be obtained using a photo ionization detector (PID), in order to document ambient readings. Site readings will be evaluated against these background readings, i.e., if an action level is listed at 15 parts per million (ppm), it is evaluated as 15 ppm above background.

A PID will be used to monitor for methane vapors. The PID will be used on a continuous basis, with readings recorded approximately every 10 minutes, to monitor in the immediate vicinity of the work area. If readings exceed an average of 15 ppm for more than one minute, monitoring within the worker's breathing zone will be conducted immediately.

A worker's breathing zone reading above 15 ppm for more than one minute will require the use of half-face respirators with organic vapor cartridges. A worker's breathing zone reading above 75 ppm for more than one minute will require the use of full-face respirators with organic vapor cartridges. If the PID reads more than 300 ppm instantaneously (> 5 seconds) or 150 ppm for more than one minute, work will stop, and the workers will move upwind while the vapors dissipate or alternative forms of protection or engineering controls are added. The table below presents a summary of the response criteria for air monitoring.

Analyzer Reading *	**Location**	**Time Period**	**Action**
PID – Hydrocarbon Vapors			
< 15 ppm	Immediate vicinity of work area	------	Continue monitoring
> 15 ppm	Immediate vicinity of work area	> 1 minute	Conduct monitoring in WBZ
> 15 ppm	WBZ	> 1 minute	Half-face respirator with organic vapor cartridge
> 75 ppm	WBZ	> 1 minute	Full-face respirator with organic vapor cartridge
> 150 ppm or > 300 ppm	WBZ WBZ	> 1 minute instantaneous	Stop work, move upwind while vapors dissipate or engineering controls are provided.

(WBZ = Worker's Breathing Zone) *Above background readings

7.2 PARTICULATE/DUST MONITORING

The areas to be investigated are paved, and therefore, there is little potential for generation of dust. No particulate monitoring will be completed.

7.3 NOISE MONITORING

No noise monitoring will be conducted (see Section 6.6.3).

8.0 TRAINING AND MEDICAL CLEARANCE

Any person involved in field work at the Site must have been trained to understand the potential health and safety hazards associated with their job function. Additionally, a medical clearance will be required for all persons working within the Exclusion Zone or Contamination Reduction Zone. Personnel will not be assigned to field activities until they have been trained to a level commensurate with their job function and the degree of anticipated hazard.

EAI will require each of its employees and subcontractors to sign an Acknowledgment of Receipt of Site Health and Safety Plan (see Form 1) and to certify that subcontractor personnel have met the requirements of the OSHA Hazardous Waste Operations Standard (29 CFR 1910.120) and other applicable OSHA standards (see Form 2).

9.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

9.1 SITE SAFETY MEETINGS

Prior to commencement of Site activities, daily Site safety meetings will be conducted to discuss potential hazards associated with completing the work. The meetings will be conducted by the SSO or PM, and attended by all personnel involved in field activities at the Site for that day.

9.2 SITE CONTROL

Barriers will be used, to the degree feasible, to define a no smoking and limited access zone around the Exclusion Zone. Access control will be established at the periphery of the Exclusion Zone to properly regulate the flow of personnel and equipment into and out of the zone. The SSO or PM will require evidence of training prior to granting entry into the Exclusion Zone. No visitors will be allowed into the Exclusion Zone unless they comply with the requirements of this HASP.

9.3 PERSONAL PROTECTIVE EQUIPMENT

The PPE selected for this project is anticipated to provide protection against the types and concentrations of contaminants that are expected to be encountered during Site work. However, no PPE is resistant to all chemicals at any concentration. In fact, chemicals may continue to permeate or degrade PPE even after the source of contamination is removed.

In order to obtain optimum PPE usage, the following procedures are to be followed:

- When using disposable coveralls, don a clean new garment after each rest break or at the beginning of each shift.

- Inspect all clothing, gloves and boots prior to and after usage for:
  - Imperfect seams
  - Non-uniform coatings
  - Tears
  - Poorly functioning closures

- Inspect reusable garments prior to and after usage for:
  - Visible signs of chemical permeation such as swelling, discoloration, stiffness or brittleness
  - Cracks or any signs of puncture or abrasion
  - Any reusable garments exhibiting any such characteristics will be discarded.

The following is the PPE list:

- Hardhats
- Safety glasses/goggles
- Ear plugs
- Tyvek coveralls
- Chemical resistant boots
- Work gloves
- Nitrile gloves
- Surgical vinyl inner gloves
- Plastic sheeting
- 55-gallon drums
- Barricade tape and barricades
- Wash buckets and scrub brushes
- Alconox detergent
- Dust masks
- Respirators
- First aid kit
- Type ABC fire extinguishers
- PID
- FID
- Combustible gas indicator

The duration of work tasks that require the use of PPE will be established by the SSO. Variables to be considered include ambient temperature and other weather conditions, the capacity of the individual personnel to work in the required level of PPE, and the limitation of the specified PPE.

9.4 SANITATION

One of the restrooms located on the Site will be designated for use by field personnel.

10.0 DECONTAMINATION PROCEDURES

Decontamination of equipment and personnel is necessary to confine contaminants to the Site and preclude migration elsewhere. An on-site area will be designated (Decontamination Zone) for decontamination of equipment. The general steps to be followed are: (1) establish an equipment drop area; (2) wash equipment with an Alconox detergent and clean water rinse (a steam cleaner also may be used); and (3) properly contain and store effluent generated from decontamination procedures.

Decontamination of personnel will consist primarily of a soap (Alconox) and water rinsing of exterior protective gear to remove contaminants, followed by removal of the gear. Disposable coveralls will be removed by turning the clothing inside out. Clean water will be provided to rinse work gloves and boots.

The above listed equipment and personnel decontamination requirements/procedures are minimums. The SSO can require additional washing, or other modifications to the procedures as deemed appropriate.

11.0 DISPOSAL PROCEDURES

All waste materials will be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left at the Site. The generated waste materials will be sealed in labeled 55-gallon drums or similar storage containers, pending proper disposal.

12.0 COMMUNICATION PROCEDURES

EAI personnel have portable telephones. The following standard hand signals will be used:

Hand gripping throat:	Out of air, can't breath
Grip partner's wrist or both hands around waist:	Leave area immediately
Hands on top of head:	Need assistance
Thumbs Up:	OK, I am all-right, I understand
Thumbs Down:	No, Negative

13.0 EMERGENCY PROCEDURES

Prior to the commencement of on-site field work, the SSO or PM will establish emergency evacuation routes. The SSO or PM will also establish the "safe zone" location, on a daily basis, as indicated by weather conditions, Site activities, etc.

13.1 MEDICAL FACILITY

All emergencies shall be immediately reported to the SSO, and addressed in accordance with 8 CCR 5192. In the event of an emergency that is beyond the capabilities of on-site trained personnel, the following resources will be utilized:

Ambulance	911
Fire Department	911
Police	911
Poison Control	800/777-6476
Hazardous Evaluation System and Information System	510/540-2115

Nearest Hospital:

Presbyterian Intercommunity Hospital
12401 Washington Boulevard
Whittier, CA 90602
(562) 698-0811

Figure 1 is an emergency route map to the hospital.

If it is determined that the emergency could threaten human health or the environment, the incident will be reported to the proper agencies.

13.2 ACCIDENT REPORTING

The accident report form (see Form 3) will be submitted by the SSO or PM and individual associated with each job related accident. Submittal of the form will be made as soon as possible but no later than 48 hours after the accident. Pertinent facts not immediately known will be submitted in a supplemental report.

13.3 DEBRIEFING

The SSO or PM will conduct personnel debriefing after all incidents and emergencies to assess preparedness, prevention and response activities. The goal of the debriefing is to ensure that similar incidents and emergencies are precluded from occurring.

14.0 RECORD KEEPING

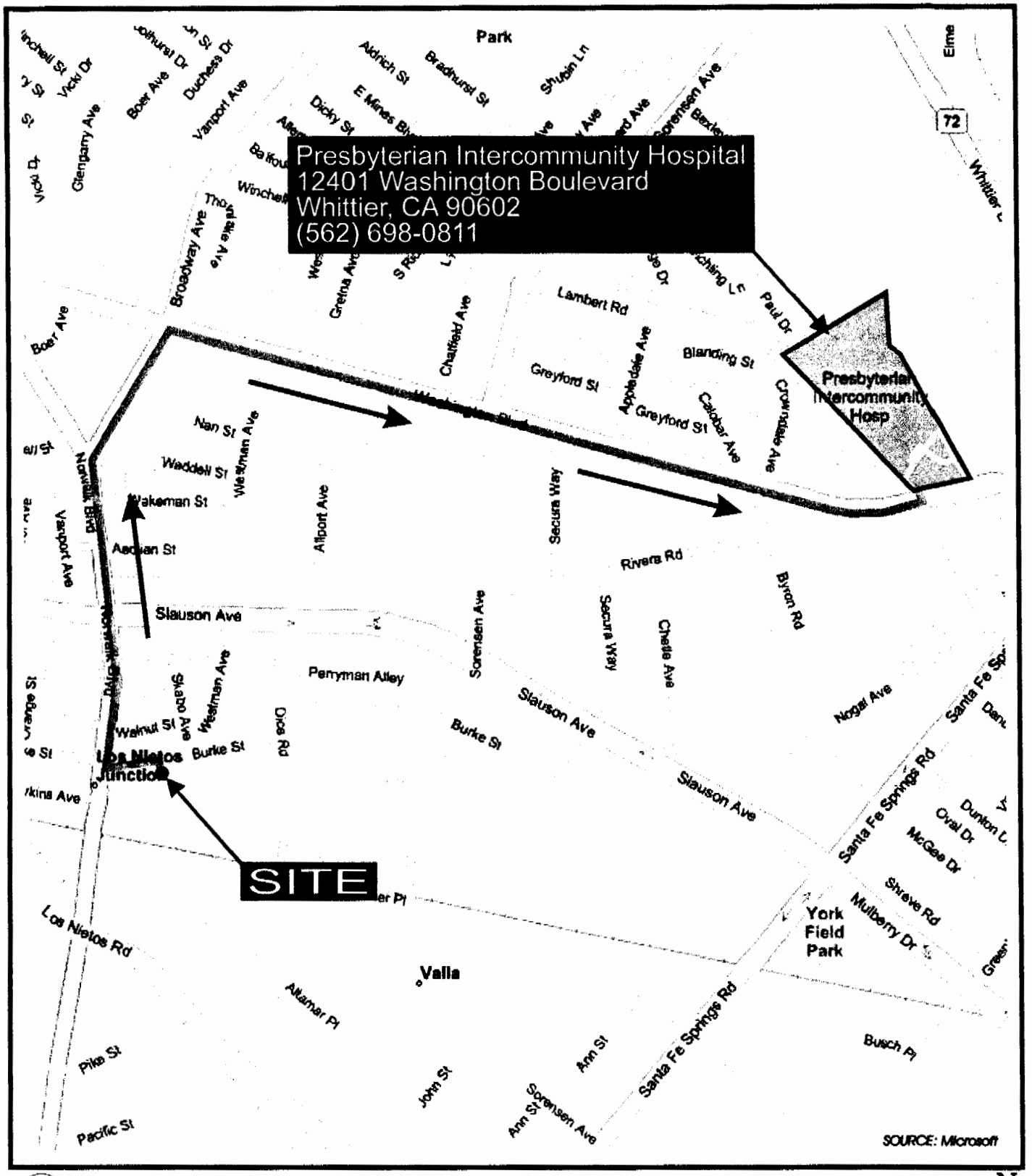
The PM and SSO are responsible for Site record keeping. A project specific field notebook will be maintained to record Site specific information including, but not limited to, on-site project personnel work dates, field monitoring results, Site visitors, and work completed each day.

15.0 LIMITATION

This HASP has been prepared using that degree of knowledge, diligence, care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at this time. No other warranty, expressed or implied, is made as to the professional advice contained in this report.

EAI does not guarantee the health and safety of any person entering the Site. Due to the hazardous nature of the Site and the activities occurring thereon, it is not possible to discover, identify, evaluate and provide protection for all the possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein and in 29 CFR and Title 8, CCR will reduce, but can not eliminate, the potential for injury at the Site.

FIGURE



Environmental Audit, Inc.

HOSPITAL ROUTE MAP
11630-11700 Burke Street
Santa Fe Spring, California

Project No. 1576

Figure 1

N:\1576\HospitalRouteMap.cdr

Original in Color

APPENDIX A

Forms

ENVIRONMENTAL AUDIT, INC. ®
1000-A Ortega Way
Placentia, CA 92870-7162
714/632-8521
714/632-6754 = FAX

ACKNOWLEDGMENT OF RECEIPT OF SITE HEALTH AND SAFETY PLAN

EAI PROJECT NO._____ CLIENT_____

HEALTH AND SAFETY PLAN DATE_____

JOB LOCATION_____

THE UNDERSIGNED CERTIFY THAT THEY HAVE RECEIVED A COPY OF THE EAI HEALTH AND SAFETY PLAN REFERENCED ABOVE, AND THAT THIS PLAN IS BEING PROVIDED BY EAI IN ORDER TO FULFILL ITS OBLIGATION UNDER 29 CFR 1910.120 TO INFORM EMPLOYEES AND CONTRACTORS OF SITE HAZARDS.

READ, UNDERSTOOD, AGREED TO AN ACCEPTED BY:

NAME	COMPANY	SIGNATURE	DATE

ENVIRONMENTAL AUDIT, INC. ®
1000-A Ortega Way
Placentia, CA 92870-7162
714/632-8521
714/632-6754 = FAX

CONTRACTOR OCCUPATIONAL SAFETY AND HEALTH CERTIFICATION

CONTRACTOR:

Name: _____

Address: _____

Telephone Number: _____

CONTRACTOR CERTIFIES THAT THE FOLLOWING PERSONAL HAVE MET THE REQUIREMENTS OF THE OSHA HAZARDOUS WASTE OPERATIONS STANDARD (29 CFR 1910.120) AND OTHER APPLICABLE OSHA STANDARDS.

NAME	TRAINING	RESPIRATOR CERTIFICATION	MEDICAL EXAMINATION

CONTRACTOR CERTIFIES THAT THE INFORMATION CONTAINED ON THIS FORM IS TRUE AND CORRECT.

NAME: _____ TITLE: _____

SIGNATURE: _____ DATE: _____

ENVIRONMENTAL AUDIT, INC. ®
1000-A Ortega Way
Placentia, CA 92870-7162
714/632-8521
714/632-6754 = FAX

ACCIDENT REPORT FORM

DATE PREPARED_____ PROJECT NO._____

PREPARED BY_____

_____

NAME OF INJURED OR ILL PERSON_____

NAME OF INJURED OR ILL PERSONS EMPLOYEER_____

DATE OF ACCIDENT_____ TIME OF ACCIDENT_____

EXACT LOCATION OF ACCIDENT_____

_____

_____

_____

_____

_____

_____

_____

NARRATIVE DESCRIPTION OF ACCIDENT_____

_____

_____

_____

_____

NATURE OF ACCIDENT_____

_____

_____

_____

LOST TIME: NO___YES___IF YES INDICATE TIME LOST_____

CORRECTIVE ACTION TAKEN_____

_____

_____

_____

_____

CORRECTIVE ACTION WHICH REMAINS TO BE TAKEN (BY WHOM AND WHEN)

_____

_____

_____

_____

I/WE CERTIFY THAT THE ABOVE INFORMATION IS TRUE, CORRECT AND ACCURATE

NAME_____DATE_____

SIGNATURE_____

NAME_____DATE_____

SIGNATURE_____

OTHER COMMENTS, IF ANY

_____

_____

_____

_____

_____

_____

_____

ATTACH ADDITIONAL PAGES IF NECESSARY

APPENDIX B

Information on Chemicals of Concern

BENZENE

CAS NO.:	71-43-2	DOT NO:	1114
OSHA PEL:	1 ppm	UEL:	7.8%
ACGIH TLV:	0.5 ppm	LEL:	1.2%
OSHA STEL:	5 ppm	VP:	75 mm
NIOSH IDLH:	500 ppm		

POTENTIAL DANGERS

Benzene, under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), is listed as a chemical known to the State of California to cause cancer. Benzene has been classified as a Human Carcinogen.

Poisoning occurs most commonly through the inhalation of vapor, though benzene can penetrate the skin and poison in that way. Acute exposure to benzene results in central nervous system depression. Headache, dizziness, nausea, convulsions, coma and death may result.

Points of attack are the blood, central nervous system, skin, bone marrow, eyes, and respiratory system.

ROUTES OF ENTRY

The common routes of entry for benzene absorption are through the inhalation of vapor and through the penetration of the skin.

FIRST AID

If this chemical gets into the eyes, flush immediately with water. If this chemical contacts the skin, wash with soap promptly. If a person breathes in large amounts of benzene, move the exposed person to fresh air at once and perform artificial respiration, if needed. When benzene has been swallowed, get medical attention. DO NOT induce vomiting. Aspiration could cause chemical pneumonia.

TOLUENE

CAS NO.:	108-88-3	DOT NO:	1294
OSHA PEL:	50 ppm	UEL:	7.1%
ACGIH TLV:	50 ppm	LEL:	1.1%
OSHA STEL:	150 ppm	VP:	21 mm
NIOSH IDLH:	500 ppm		

POTENTIAL DANGERS

Local harmful effects of toluene include irritation of the eyes, respiratory tract and skin. Repeated or prolonged contact with toluene may cause removal of natural lipids from the skin, resulting in dry, fissured dermatitis. Toluene splashed in the eyes may cause irritation and reversible damage.

Systemic effects of acute exposure to toluene predominantly may result in central nervous system depression. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness, skin paresthesia and coma.

Points of attack are the central nervous system, liver, kidneys and skin.

ROUTES OF ENTRY

Inhalation of vapor, percutaneous dermal absorption, ingestion, skin and eye contact.

FIRST AID

If toluene gets into the eyes, immediately flush with water for 15 minutes. If toluene contacts the skin, promptly wash with soap and water. If a person breathes in large amounts of toluene, move the exposed person to fresh air at once and perform artificial respiration, if needed. When toluene has been swallowed, get medical attention. DO NOT induce vomiting; aspiration may cause chemical pneumonia.

PERCHLOROETHYLENE
(Tetrachloroethylene)

CAS NO.:	127-18-4	DOT NO:	1897
PEL:	25 ppm	UEL:	NA
TLV:	25 ppm	LEL:	NA
STEL:	100 ppm	VP:	14 mm
IDLH:	150 ppm		

POTENTIAL DANGERS

Perchloroethylene (PCE) has been classified as a carcinogen (positive, NCI), as a hazardous material (EPA), and a priority toxic pollutant (EPA).

Local harmful effects of repeated contact include a dry, scaly, and fissured dermatitis. High concentrations may produce eye and nose irritation.

Systemic or acute exposure to PCE may cause central nervous system depression, hepatic injury, and anesthetic death. Cardiac arrhythmias and renal injury have been produced in animal experiments. Signs and symptoms of overexposure include malaise, dizziness, headache, increased perspiration, fatigue, staggering gait, and slowing of mental ability. These usually subside quickly upon the removal into the open air.

Points of attack are the liver, kidneys, eyes, upper respiratory system, and central nervous system.

ROUTES OF ENTRY

PCE can enter the body through inhalation of vapor, percutaneous absorption of liquid, ingestion, and skin and eye contact.

FIRST AID

If PCE gets into the eyes, flush immediately with water for 15 minutes. If this chemical contacts the skin, wash with soap promptly. If a person breathes in large amounts of PCE, move the exposed person to fresh air at once and perform artificial respiration, if needed. When this chemical has been swallowed, get medical attention. Give large quantities of salt water and induce vomiting. **DO NOT** make an unconscious person vomit.

TRICHLOROETHYLENE

CAS NO.:	79-01-6	DOT NO:	2831
PEL:	25 ppm	UEL:	10.5%
TLV:	25 ppm	LEL:	8%
STEL:	100 ppm	VP:	58 mm
IDLH:	1,000 ppm		

USES

Trichloroethylene (TCE) is a colorless, nonflammable, mobile liquid with a sweetish odor resembling chloroform. TCE is primarily used as a solvent in vapor degreasing. It is also used for extracting caffeine from coffee, as a dry cleaning agent, and as a chemical intermediate in the production of pesticides, waxes, gums, resins, tars, paints, varnishes, and specific chemicals such as chloroacetic acid.

POTENTIAL DANGERS

TCE has been classified as a carcinogen (animal positive, IARC), as a hazardous substance (EPA), as a hazardous waste (EPA), and as a priority toxic pollutant (EPA).

Exposure to TCE vapor may cause irritation of the eyes, nose and throat. The liquid, if splashed in the eyes, may cause burning irritation and damage. Repeated or prolonged skin contact may cause dermatitis.

Acute exposure depresses the central nervous system causing such symptoms as headaches, dizziness, vertigo, tremors, nausea and vomiting, irregular heartbeat, sleepiness, fatigue, blurred vision and intoxication similar to that of alcohol. Unconsciousness and death have been reported.

Points of attack are the respiratory system, heart, liver, kidneys, central nervous system and skin.

ROUTES OF ENTRY

Inhalation, dermal absorption, ingestion, skin and eye contact.

FIRST AID

If this chemical gets into the eyes, flush immediately with water. If this chemical contacts the skin, wash with soap promptly. If a person breaths in large amounts of this chemical, move the exposed person to fresh air immediately and perform artificial respiration, if needed. When this chemical has been swallowed, get medical attention. Give large quantities of salt water and induce vomiting. **DO NOT** make an unconscious person vomit.

LEAD

CAS NO.:	7439-92-1	UEL:	NA
PEL:	0.05 mg/m3	LEL:	NA
TLV:	0.05 mg/m3	VP:	0 mm
STEL:	--		
IDLH:	100 mg/m3		

POTENTIAL DANGERS

There are generally no local harmful effects of lead exposure, but systemic effects of lead poisoning become more obvious over time. The early affects are often nonspecific, and without laboratory testing, are difficult to distinguish from symptoms of seasonal illness. The early symptoms of lead poisoning are decreased fitness, fatigue, sleep disturbance, headache, aching bones and muscles, digestive problems (constipation), abdominal pains, and a decreased appetite. These symptoms are reversible, and complete recovery is possible.

Later stages of lead poisoning include anemia, pallor, a "lead line" or blue line on the gums, and decreased handgrip strength. Lead colic produces an intense periodic abdominal cramping associated with severe constipation and, occasionally, nausea and vomiting. The peripheral nerve affected most frequently is the radial nerve. When the central nervous system is affected, it is usually due to the ingestion or inhalation of large amounts of lead. This results in severe headache, convulsions, coma, delirium, and possibly death. Kidney damage may occur after prolonged exposure to lead.

The major points of attack on the human body are the kidneys, blood, gingival tissue, gastrointestinal system, and central nervous system.

ROUTES OF ENTRY

The common routes of entry of lead into the human body are ingestion of dust, inhalation of dust or fumes, and skin and eye contact.

FIRST AID

If lead gets into the eyes, flush eyes immediately with large quantities of water. If lead contacts the skin, flush with soap and water promptly. If a person breathes in large amounts of lead, move the exposed person to fresh air at once and perform artificial respiration, if needed. When lead has been swallowed, get medical attention. Give large quantities of salt water and induce vomiting. **DO NOT** make an unconscious person vomit.

APPENDIX D

H&P's Soil Vapor Standard Operating Procedures Fulfilling CA-EPA (DTSC) Soil Gas Advisory, Revision 4, January 2007

MOBILE GEOCHEMISTRY

H&P

Soil Vapor Standard Operating Procedures Fulfilling CA-EPA (DTSC) Soil Gas Advisory

Revision 4

January 2007

Prepared by:

H&P Mobile Geochemistry

Carlsbad, California

Soil Gas Sampling Procedures

Probe Construction and Insertion

Manually-Driven Probes

H&P's manually driven soil vapor probes are constructed of 0.625 inch outside diameter steel and equipped with a hardened steel tip. The probes can reach a depth of 5 feet below ground surface. An inert 1/8 inch nylaflow tube is threaded down the center of the probe and connected to a sampling port just above the tip. This internal sample tubing design eliminates any contact between the sample port and the gas sample.

The probe is driven into the ground by an electric rotary hammer. Once inserted to the desired depth, the probe is rotated approximately 3 turns to open the tip and exposes the vapor sampling ports. This design prevents clogging of the sampling ports and cross-contamination from soils during insertion.

Hydraulically-Driven Probes

H&P's hydraulically-driven soil vapor probes are constructed of either 1.25 or 1.5 inch outside diameter steel and equipped with a hardened drop-off steel tip. The probes are nominally 4 feet long and threaded together to reach multiple depths. The probe is driven into the subsurface with H&P's *STRATAPROBE*™ direct-push system. Once inserted to the desired depth, the probe is retracted slightly to expose the vapor sampling port. A small diameter inert tubing is then inserted through the center of the rod and threaded into a gas tight fitting just above the tip. After a sample is obtained the tubing is removed and the probe rod advanced to the next sampling depth or removed. This design prevents clogging of the sampling port and cross-contamination from soils during insertion.

Surface Seals

The probe rod is sealed at the surface with granular and hydrated bentonite for a minimum of 20 minutes before sampling.

Soil Gas Sampling

Soil vapor is withdrawn from the end of the inert nylaflow tubing that runs from the sampling tip to the surface using a 20 to 60 cubic centimeter (cc) syringe or gas tight canister (Summa) connected via an on-off valve (see diagram). The probe tip and sampling tubing is nominally purged of three to five internal dead volumes, or based upon a pre-determined purge volume established by a purge volume test described below. A sample of in-situ soil vapor is then withdrawn and immediately transferred to the mobile lab for analysis within minutes of collection. The use of small calibrated syringes allowed for careful monitoring of purge and sample volumes. This procedure ensures adequate sample flow is obtained without excessive pumping of air or introduction of surface air into the sample.

For off-site analysis, samples are collected in canisters or in tedlar bags when allowed. Samples collected in tedlar bags for VOC analysis are either analyzed on the same day or transferred to a canister.

Purge Volume Test

If required, a site specific purge volume test is conducted at the beginning of the soil gas survey to purge ambient air from the sampling system. Three different volumes are sampled (nominally 1, 3, 7 purge volumes) and analyzed immediately to determine the volume amount with the highest concentration. Therefore, the optimum purge volume is achieved and used during the entire site investigation.

Use of Tracer Compound to Ensure Probe Seal Integrity

A tracer compound, typically difluoroethane, iso-propanol, or butane, is used to test for leaks around the probe barrel at the ground surface and in the sampling system. The tracer is placed around the base of the probe barrel and at the top of the probe barrel during sample collection. If the tracer is detected per CA-EPA advisory specifications, another sample is collected.

Sample Flow Rate

Sample collection is timed so that the flow rate does not exceed 200 ml/per minute. This is accomplished by withdrawing the plunger on the 60 cc syringe at a constant rate for 20 seconds. The collector notes the collection time on a logsheet. and also records any resistance to sample flow that is felt on the syringe during collection.

Summa Canister

Summa canisters are connected to the end of the nylaflow tubing to the same three way valve used with the syringe. A choke is placed on the canister to ensure that the flow rate is no more than 200 ml/ per minute into the summa canister.

Field Records

The field technician maintains a logsheet summarizing:

- Sample identification
- Probe location
- Date and time of sample collection
- Sampling depth
- Identity of samplers
- Weather conditions
- Sampling methods and devices
- Soil gas purge volumes
- Volume of soil gas extracted
- Observation of soil or subsurface characteristics (any condition that affects sample integrity)
- Apparent moisture content (dry, moist or saturated etc.) of the sampling zone
- Chain of custody protocols and records used to track samples from sampling point to analysis.

Analytical Methodology

The following analytical protocols fulfills the both the CA-EPA advisory (2003) and LA-RWQCB soil gas analytical guidelines (1997).

Operating Conditions and Instrumentation

Volatile Organic Compounds (VOCs) by EPA 8260

Instrument: Hewlett-Packard 6890(6850)/5973 or 5890/5972 GCMS
Column: 25 meter HP-624, 0.20mm x 1.0u. capillary.
Carrier flow: Helium at 1.0 ml/min.
Detectors: Quadrupole MS, full scan mode
Concentrator: Tekmar 3000/Solatek 72

Volatile Organic Compounds (VOCs) by EPA TO-14 or TO-15

Instrument: Hewlett-Packard 6850/5973
Column: 60 meter HP-624, 0.32mm x 1.8u. capillary.
Carrier flow: Helium at 3.0 ml/min.
Detectors: Quadrupole MS, full scan mode
TO-14 Instrumentation: Entech 7100 Air Concentrator/Entech 7300 Autosampler

Fixed and Biogenic Gases (O2, CO2, & Methane)

Instrument: SRI 8610 or Carle AGC 311 Gas Chromatograph
Column: 6 foot CTR
Carrier flow: Helium at 15 ml/min.
Detectors: Thermoconductivity (TCD) for O2 & CO2.

Detectors: Flame ionization detector (FID) for methane.

Hydrogen Sulfide

Instrument: Jerome 631x
Detectors: Gold-film

Standard Preparation

Primary (stock) standards: Made from certified neat components or from traceable standards purchased from certified suppliers.

Secondary (working) Standards: Made by diluting primary standard. Typical concentrations are 1ug/ml, 10 ug/ml, and 50 ug/ml.

Laboratory Check Samples are prepared at the midpoint concentration from a standard purchased from a source different than the primary standards.

Lot numbers and preparations of all standards are recorded on a log sheet and kept in the mobile laboratory.

Gas Standards for TO-14A/15 analysis purchased from Spectra Gases, Branchburg, N.J. diluted from 1.0 ppmv to 10ppbv (for targets) and 1.0ppmv to 100ppbv (internal standards and surrogates

Initial Multi-Point Calibration Curve

An initial calibration curve of a minimum of 3 points is performed either:

- At the start of the project.
- When the GC column or operating conditions have changed
- When the daily mid-point calibration check cannot meet the requirements as specified below.
- For TO-15 a five point calibration is used.

Calibration curves for each target component are prepared by analyzing low, mid, and high calibration standards covering the expected concentration range. The lowest standard concentration will not exceed 5 times the reporting limit for each compound.

A linearity check of the calibration curve for each compound is performed by computing a correlation coefficient and an average response factor. If a correlation coefficient of 0.990 or a percent relative standard deviation (%RSD) of $\pm$ 15% is obtained, an average response factor is used over the entire calibration range. If the linearity criteria are not obtained, quantitation for that analyte is performed using a calibration curve.

After each initial multi-point calibration, the validity of the curve is further verified with a laboratory control standards (LCS) prepared at the mid-point of the calibration range. The LCS includes all target compounds and the response factor (RF) must fall within $\pm$ 20% of the factor from the initial calibration curve.

Continuing Calibration (Daily Mid-point Calibration Check)

Continuing calibration standards prepared from a traceable source are analyzed at the beginning of each day. Acceptable continuing calibration agreement is set at $\pm$ 20% to the average response factor from the calibration curve, except for freon, chloroethane, and vinyl chloride when a 25% agreement is required. When calibration checks fall outside this acceptable range for analytes detected on the site, corrective action, consisting of verification of the standard and/or a new calibration curve for the analytes out of specifications is performed by the on-site chemist.

The continuing calibration includes all compounds expected or detected at the site in addition to any specific compounds designated in the project workplan.

Detection Limits

Reporting limits for this program are defined as 5 times lower than the lowest concentration standard of the calibration curve, as follows:

Compound	Detector	Report Limit
VOCs by TO-14A/15	Mass Spec	1.0 to 5 ppbv
VOCs	Mass Spec	0.1 to 1 ug/l-vapor
Methane	FID	10 ppmv
Fixed Gases	TCD	0.1% by vol
H2S	Gold Film	0.10 ppmv

Injection of Soil Gas Samples

Vapor samples are withdrawn from the probe sampling syringe with a 5 cc syringe and injected with surrogates into a purge & trap instrument for VOC analysis. Separate aliquots are directly injected into gas chromatographs for fixed gases and methane analysis. The injection syringe is flushed 2 times with the sample prior to injection. Injection syringes are flushed several times with clean air or discarded between injections.

TO-14A/15 samples are taken into Summa or similar passivated canisters. Holding time for these canisters is 30 days.

Laboratory Data Logs

The field chemist maintains injection and sample analysis records including date and time of analysis, sampler's name, chemist's name, sample ID number, concentrations of compounds detected, calibration data, and any unusual conditions.

Quality Control Procedures

Compliance With Standards

Sampling and analytical procedures complied with the American Society for Testing and Materials' *Standard Guide for Soil Gas Monitoring in the Vadose Zone* (ASTM D5314-93), the LA-RWQCB Soil Gas Guidelines (Feb 1997 version), and the San Diego County SAM Soil Gas Guidelines (October, 2001).

Sampling Quality Control

Method Blanks

Prior to sampling each day, all components of the sampling system are checked for contamination by drawing ambient air from above ground through the sampling equipment, and injecting a sample into a gas chromatograph. The analysis results are compared to that of the ambient air and recorded in the data tables as blanks.

Sample Quality Control

Each sample is given a unique identification number specifying location and depth. Purge and sample volumes are monitored closely using small calibrated syringes to assure a proper flow of soil gas. This ensures a representative sample is obtained from the sample zone without excessive pumping, which could result in sampling of surface air.

Decontamination Procedures

To minimize the potential for cross-contamination between sites, all external soil vapor probe parts are wiped or washed cleaned of excess dirt and moisture with solvents or de-ionized water as appropriate. The probe's internal nylaflow tubing is purged with clean air between sampling locations or replaced as necessary. Sampling syringes are flushed with clean air after each use or replaced.

Corrective Action

Corrective action is taken when unexpected contaminant levels are detected. First duplicate samples are taken to verify the initial detection of petroleum hydrocarbons. If contamination is suspected, then the sample probes are disassembled, wiped cleaned of excess dirt and moisture, rinsed with deionized water, washed with Alconox and water, and rinsed again with

deionized water. The sample tubing in the probe is replaced. Contaminated sampling syringes are discarded.

Analytical Quality Control

Method Blanks

Method blanks are performed at the start of each day by drawing clean air through the sampling equipment and analyzing. These blanks verify all components of the sampling and analytical system are free of contamination. Additional blanks are performed more often as appropriate depending upon the measured concentrations, at a minimum 1 every 20 samples. The results of all blank analyses are recorded in the data tables. If a blank shows a measurable amount of any target compound, the on-site chemist will investigate and determine the source, and resolve the contamination problem prior to analyzing any samples.

Duplicate Samples

Duplicate (repetitive) analysis of a sample is performed when inconsistent data are observed, but at least one every 20 samples. Because soil vapor duplicates can vary widely, nominal relative percent difference (RPD) acceptance criteria is $\pm$ a factor of 2.

Continuing Calibration (Daily Mid-point Calibration Check)

As described on page 5 of this document, continuing calibration standards prepared from a traceable source are analyzed at the beginning of each day.

The continuing calibration includes all compounds expected or detected at the site and any specific compounds designated in the project workplan.

Laboratory Check Samples (LCS)

Laboratory check samples, prepared at the lowpoint concentration from a standard purchased from a source different than the calibration standards, are analyzed at the end of each day if all samples are below detection. Acceptance criteria is $\pm$ 20% from the true value. If the LCS falls outside this acceptance range for analytes detected on site, corrective action, consisting of verification of the standard and/or a new calibration curve for the analytes out of specifications, is performed.